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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 13, 1984.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 20, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	4,778 through 4,780
Utility Patents	4,295,227 through 4,296,496

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	$ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,298,474, Re. S.N. 619,365, Filed June 11, 1984, Cl. 210/238, MULTIPLE FILTER VESSEL, Donald A. Sillers, Jr., Owner of Record: *Peerless Manufacturing Co., Dallas, Tex.*, Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 136

4,320,612, Re. S.N. 586,373, Filed Mar. 5, 1984, Cl. 52/396, END BLOCK, Ernest H. Jeffries, Jr., Owner of Record: *Resco Products, Inc., Norristown, Pa.*, Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 354

4,334,392, Re. S.N. 619,835, Filed June 12, 1984, Cl. 52/157, MODULAR SCREW ANCHOR HAVING LEAD POINT NON-INTEGRAL WITH HELIX PLATE, Edward Dziedzic, Owner of Record: *A. B. Chance Co., Centralia, Mo.*, Attorney or Agent: Gordon D. Schmidt, et al., Ex. Gp.: 356

4,340,208, Re. S.N. 619,536, Filed June 11, 1984, Cl. 266/220, REFRACTORY PIECE PERMEABLE TO GASES, Pierre Vayssiere, et al., Owner of Record: *Institut de Recherches de la Siderurgie Francaise, Saint-German-en-Laye, France,* Attorney or Agent: Arthur F. Dionne, et al., Ex. Gp.: 111

4,375,245, Re. S.N. 596,290, Filed Apr. 3, 1984, Cl. 424/241, SPIRONOLACTONE-CONTAINING COMPOSITION AND USE THEREOF, German Shapiro, Owner of Record: *Inventor*, Attorney or Agent: Harold Wegner, et al., Ex. Gp.: 123

4,391,695, Re. S.N. 619,778, Filed June 11, 1984, Cl. 204/286, COATED METAL ANODE FOR THE ELECTROLYTIC RECOVERY OF METALS, Konrad Koziol, et al., Owner of Record: *Conradty GmbH & Co., Rothenbach, Dex*, Attorney or Agent: John B. Young, et al., Ex. Gp.: 112

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Qualifications for Admission to the Examination for Registration to Practice Before the Patent and Trademark Office

37 CFR 1.341(c) provides in pertinent part, "No person will be admitted to practice and registered unless he shall . . . establish to the satisfaction of the Commissioner that he is of good moral character and good repute and *** possessed of the legal and scientific and technical qualifications necessary to enable him to render applicants for patents valuable service ***. In order that the Commissioner may determine whether the person *** has the qualifications specified, satisfactory proof of good moral character and repute, and of sufficient basic training in scientific and technical matters must be submitted ***."

All persons requesting application forms are routinely furnished with a circular entitled "General Requirements For Admission To The Examination For Registration To Practice Before The Patent and Trademark Office". The circular contains a list of the subjects in which a person must have a bachelor's degree or the equivalency thereof in scientific and technical training to meet registration qualifications. It is strongly recommended that persons who do not have a bachelor's degree in one of those subjects comply with the instructions in the paragraph following the list to show their scientific and technical qualifications. If it is intended to rely on courses in computer science, no more than 3 semester hours of courses in computer programming will be accepted as providing part of the required basic training in scientific and technical matters. Computer science courses oriented away from the physical sciences or engineering, e.g., toward accounting or business, will not be accepted as providing any of the requisite basic training in scientific and technical matters.

Many applications for admission to an examination are filed on or just prior to the announced closing date for doing so, and these applications are frequently disapproved because the person does not furnish a satisfactory showing of his or her qualifications. For instance, persons with a bachelor's degree in a subject other than one of those listed in the circular frequently do not follow instructions in the circular and do not furnish both their transcripts and official course descriptions. Other persons list charges brought against them requiring further showings to overcome doubts raised by the charges about their character and reputation. Still others who failed one section of the examination three times do not furnish a satisfactory showing of sufficient additional legal training to pass the examination.

The Office of Enrollment and Discipline evaluates each application for admission to the examination on an individual basis as soon as practical after receipt in that office. Thereafter, notification is promptly mailed to each person whose application has been disapproved.

The Office of Personnel Management (OPM — formerly Civil Service Commission), which administers the examination, requires that it receive correct data from the Patent and Trademark Office identifying the locale of the examination and the number of persons to be tested well ahead of the examination date. *To afford adequate time to present a satisfactory supplemental showing to gain admission to the examination for which application is being made, it is recommended that all persons file their applications early, preferably at least two months before the closing date.*

All supplemental showings of qualifications and all applications filed after the announced closing date to apply for admission to an examination will be considered only in connection with the person's admission to the next succeeding examination. Admission to an examination given on a particular date is available only to persons who have filed a completed application form, a $75.00 admission fee, and a satisfactory showing of qualifications on or before the closing date for applying for admission to the examination. Examinations are given in Apr. and Oct. each year, and the respective closing dates for applying for admission to the examinations are the preceding Jan. 31 and July 31.

WILLIAM FELDMAN,
Sept. 18, 1984. *Director of Enrollment and Discipline.*

DEPARTMENT OF DEFENSE
Department of the Navy
Government-Owned Inventions
Availability for Licensing

The inventions listed below are assigned to the United States Government as represented by the Secretary of the Navy and are made available for licensing by the Department of the Navy.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $1.00 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), 5285 Port Royal Rd., Springfield, Va. 22161. Requests for copies of patent applications must include the patent application serial number. Claims are deleted from patent application copies sold to avoid premature disclosure.

For further information contact:

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Office of Naval Research (Code 305)
Ballston Tower No. 1
Arlington, Va. 22217
Telephone No. 202-696-4005

Federal Register U.S. Department of the Navy, Director, Navy Patent Program/Patent Counsel for the Navy, Arlington, Va. 22217

Patent application 248,932. Booster for Missile Fuze. Filed Mar. 30, 1981.

Patent application 276,856. Penetrator Interface Adapter Concept. Filed June 24, 1981.

Patent application 317,040. Standardized Compact Modular Boiler. Filed Nov. 2, 1981.

Patent application 319,153. Directional Data Stabilization System. Filed Nov. 6, 1981.

Patent application 320,999. Optical Fiber Gyroscope with (3×3) Directional Coupler. Filed Nov. 13, 1981.

Patent application 351,799. Nickel-Base Superalloy Having Improved Heat Treatment Range. Filed Feb. 24, 1982.

Patent application 353,677. Fiber Optic Rotation-Sensing Gyroscope with (3×2) Coupler. Filed Mar. 1, 1982.

Patent application 354,260. Unsymmetrical Polynitrocarbonates and Symmetrical 1,3-BIS (HALO-AND NITROALKYL CARBONYLDIOXY)-2,2-DINITROPROPANES and Methods of Preparation. Filed Mar. 3, 1982.

Patent application 354,261. Unsymmetrical Polynitrocarbonates and Symmetrical 1,3-BIS (HALO-AND NITROALKYL CARBONYLDIOXY)-2,2-DINITROPROPANES and Methods of Preparation. Filed Mar. 3, 1982.

Patent application 373,943. Sonobuoy Float Inflation & Depth Selection Initiators. Filed May 3, 1982.

Patent application 375,141. Roller Bearing Hot Box Sensor. Filed May 5, 1982.

Patent application 387,133. Holographic Moment Generator. Filed June 10, 1982.

Patent application 390,160. A Novel Method for the Preparation of CF_3NF_2. Filed June 21, 1982.

Patent application 392,854. On Block Surface Roughness Testing Device for Transparent Substrates. Filed June 28, 1982.

Patent application 395,546. One-Side Transducer Lead Connection. Filed July 6, 1982.

Patent application 395,557. Gated Fiber Optic Transmission. Filed July 6, 1982.

Patent application 403,822. Aerodynamic Housing. Filed July 30, 1982.

Patent application 412,616. Automatic Centering Servo Actuator. Filed Aug. 30, 1982.

Patent application 418,894. Fluorocarbon-Metal Composites for Surable Airfield Funway Markings. Filed Sept. 16, 1982.

Patent application 432,610. Environmental Crack Arrestment Composition. Filed Oct. 4, 1982.

Patent application 434,645. Microstrip Fed Frequency Independent Antenna. Filed Oct. 15, 1982.

Patent application 437,086. Preparation of Water-Displacing Paint. Filed Oct. 27, 1982.

Patent application 442,497. Fiber-Optic System for Measuring Electric Fields. Filed Nov. 18, 1982.

Patent application 445,321. Windowless Non-Resonant Optacoustic Cell. Filed Nov. 26, 1982.

Patent application 445,401. Oil Nebulizer. Filed Nov. 30, 1982.

Patent application 446,284. Wave Powered Buoy Generator. Filed Dec. 2, 1982.

Patent application 446,292. Real-Time Ultra-High Resolution Image Projection Display Using Laser Addressed Liquid Crystal Light Valve. Filed Dec. 2, 1982.

Patent application 446,295. Printed Circuit Card Hybrid Fiber Optic Connector. Filed Dec. 2, 1982.

Patent application 453,068. Device for Underwater Cryogenic Cutting. Filed Dec. 27, 1982.

Patent application 455,438. Computer Hardware Executive. Filed Jan. 3, 1983.

Patent application 458,597. Electrodeposition of Refractory Metal Carbide(s). Filed Jan. 17, 1983.

Patent application 462,642. Inflatable Bottom Construction for Inflatable Boat. Filed Jan. 31, 1983.

Patent application 463,097. Reproducible Standard for Aligning Fiber Optic Connectors Which Employ Graded Refractive Index Rod Lenses. Filed Feb. 2, 1983.

Patent application 471,083. Ion Implanted Dopants for Ternary Compounds. Filed Mar. 1, 1983.

Patent application 471,098. Low Resistance Ohmic Contact. Filed Mar. 1, 1983.

Patent application 471,909. Optical Inspection Device. Filed Mar. 3, 1983.

Patent application 471,940. Method of Reducing Bioluminescence Effects Created by Objects Moving Through Seawater. Filed Mar. 3, 1983.

Patent application 478,592. Elevator/Hatch Controller Platform Leveling Logic with Safety Features. Filed Mar. 24, 1983.

Patent application 479,372. Automatic Character Recognition System. Filed Mar. 28, 1983.

Patent application 481,173. Integrated Hydrophone Preamplifier Telemetry Assembly. Filed Apr. 1, 1983.

Patent application 481,213. A New Guidance Law to Improve the Accuracy of Tactical Missiles. Filed Apr. 1, 1983.

Patent application 481,520. Shallow Depth Lead Weight Ejection Circuit. Filed Apr. 1, 1983.

Patent application 481,532. Pseudo-Random Noise Generator Calibration for Acoustic Hydrophones. Filed Apr. 1, 1983.

Patent application 482,692. A Precision Fathometer Interface Adaptor. Filed Apr. 6, 1983.

Patent application 483,988. Constant Beamwidth Frequency Independent Acoustic Antenna. Filed Apr. 11, 1983.

Patent application 484,346. Recovery of Fragile Layers Produced on Substrates by Chemical Vapor Deposition. Filed Apr. 12, 1983.

Patent application 484,764. Optical Fibers Having a Fluoride Glass Cladding and Method of Making. Filed Apr. 14, 1983.

Patent application 484,810. Picosecond Broadband Cars Probe Using the Picosecond Continuum. Filed Apr. 14, 1983.

Patent application 488,924. Real-Time Fourier Transformer Using One Acousto-Optical Cell. Filed Apr. 27, 1983.

Patent application 488,930. Real Time Fourier Transformer Using One Acousto-Optical Cell. Filed Apr. 27, 1983.

Patent application 490,706. Video/Digital Data Multiplexer. Filed May 2, 1983.

Patent application 490,827. Air Bag Restraint System. Filed May 2, 1983.

Patent application 490,891. Surface Sealing of Ceramic Coating. Filed May 2, 1983.

Patent application 490,892. Broadband Unpolarized Light Source. Filed May 2, 1983.

Patent application 490,994. Method for Predicting the Performance of Cathode Material. Filed May 2, 1983.

Patent application 490,996. Microminiature Gas Chromatograph Direct Insertion Probe for Mass Spectrometers. Filed May 3, 1983.

Patent application 491,504. Retro-Reflective Alignment Technique for Fiber Optical Connectors. Filed May 4, 1983.

Patent application 491,686. Integrated High-Gain Active Radar Augmentor. Filed May 5, 1983.

Patent application 492,088. Conversion of Prostaglandin Analogs into a Bicarbonate Insoluble Oligomeric Mixtures. Filed May 6, 1983.

Patent application 492,988. Worksystems Package Automatic Tool Interchange. Filed May 9, 1983.

Patent application 493,461. Air Conditioning System with Evaporative Cooling Apparatus. Filed May 11, 1983.

Patent application 493,482. An Electronic Phase Shifter Having a Constant Magnitude Output. Filed May 11, 1983.

Patent application 493,831. Doppler Tolerant Binary Phase Coded Pulse Compression System. Filed May 12, 1983.

Patent application 493,860. Diurnal Effects Simulator. Filed May 12, 1983.

Patent application 494,156. An Impact Switch for Guided Projectiles. Filed May 13, 1983.

Patent application 495,028. Polychromatic Time-Integrating Optical Processor for High-Speed Ambuguity Processing. Filed May 16, 1983.

Patent application 495,188. Flight Simulator with Dual Probe Multi-Sensor Simulaltion. Filed May 16, 1983.

Patent application 495,215. A Method for Sea Surface High Frequency Radar Cross-Section Estimation Using Doppler Spectral Properties. Filed May 16, 1983.

Patent application 498,337. Personal Alpha Contamination Simulator and Detector. Filed May 26, 1983.

Patent application 499,576. An Apparatus for Scanning a Rotating Gyroscope. Filed May 31, 1983.

Patent application 499,710. Novel Electrically Conductive Polymers. Filed May 31, 1983.

Patent application 499,716. Yaw Stabilization for Aircraft Ejection Seats. Filed May 31, 1983.

Patent application 499,978. Turnable Gyro-Klystron. Filed June 1, 1983.

Patent application 500,127. Radiative Opacity and Emissivity Measuring Device. Filed June 1, 1983.

Patent application 500,724. Process for Fabricating Cryogenic Targets. Filed June 3, 1983.

Patent application 500,725. Device for Cryogenically Fabricating Source Material for Plasma X-Ray Lasers. Filed June 3, 1983.

Patent application 502,030. Thermo Electric Valve. Filed June 8, 1983.

Patent application 502,797. Universal Microcomputer for Individual Sensors. Filed June 9, 1983.

Patent application 503,010. Electrical Connector for Sonobouys. Filed June 10, 1983.

Patent application 503,913. Optical Sensing Devices. Filed June 13, 1983.

Patent application 503,977. A Frequency Independent Constant Beamwidth Lens Antenna. Filed June 13, 1983.

Patent application 504,331. Optical Matrix-Matrix Multiplier Based on Outer Products Decomposition. Filed June 14, 1983.

Patent application 504,907. Expendable Underwater Acoustic Projector. Filed June 16, 1983.

Patent application 504,994. Method of Laser Welding. Filed June 16, 1983.

Patent application 505,569. Amplitude and Phase Modulation in Fin Lines: Electrical Tuning. Filed June 17, 1983.

Patent application 505,570. Twin-Aperture Phased Array Lens Antenna. Filed June 17, 1983.

Patent application 505,584. Shielding Apparatus for Microwave Thawing. Filed June 20, 1983.

Patent application 505,589. Deep Ocean Wide Band Acoustic Baffle. Filed June 20, 1983.

Patent application 506,090. Method of Mass Spectrometry. Filed June 20, 1983.

Patent application 506,169. Apparatus for Heating Contained Liquid. Filed June 20, 1983.

Patent application 506,945. Pulse Compression Sidelobe Suppressor. Filed June 22, 1983.

Patent application 507,258. Gyromagnetron Amplifier. Filed June 23, 1983.

Patent application 508,649. Frequency Domain NonLinear Signal Processing Apparatus and Method for Discrimination Against Non-Gaussian Interference. Filed June 28, 1983.

Patent application 508,692. Blood Substitute and Method of Making. Filed June 28, 1983.

Patent application 508,774. Preparation of Simple Nitromium Salts. Filed June 29, 1983.

Patent application 508,789. Recrystallization of Hexanitrostilbene from Dimethylsulfoxide and Menthanol. Filed June 29, 1983.

Patent application 510,131. A Free Nuclear Precession. Filed July 1, 1983.

Patent application 510,535. An Apparatus for Demodulating Gyroscope Position Information. Filed July 5, 1983.

Patent application 510,851. A Portable Infrared Spectrophotometer. Filed July 5, 1983.

Patent application 511,351. Expendable Infrared Source and Method Therefor. Filed July 6, 1983.

Patent application 512,045. Palindromic Polyphase Code Expander-Compressor. Filed July 8, 1983.

Patent application 513,195. A Method for Forming High Superconduction Tc Niobium Nitride Film at Ambient Temperatures. Filed July 12, 1983.

Patent application 514,739. An Apparatus and Method for Remotely Detecting the Presence of Chemical Warfare Nerve Agents in an Air-Released Thermal Cloud. Filed July 19, 1983.

Patent application 521,798. Electronically Conductive Polymer Compositions. Filed Aug. 10, 1983.

Patent application 524,186. Small Arms Ammunition Loading System. Filed Aug. 17, 1983.

Patent application 524,828. Multi-Level Resist Technique for Lithography on Ceramic Substrates. Filed Aug. 19, 1983.

Patent application 525,340. Forced Entry/Ballistic Resistant Laminar Materials System. Filed Aug. 22, 1983.

Patent application 526,252. A Piezoelectric Polymer Hydrophone. Filed Aug. 25, 1983.

Patent application 527,529. Sidelobe Canceller with Adaptive Antenna Subarraying Using a Weighted Butler Matrix. Filed Aug. 29, 1983.

Patent application 527,626. Complex Cavity Gyrotron. Filed Aug. 29, 1983.

Patent application 525,340. Forced Entry and Ballistic Resistant Laminar Structure. Filed Aug. 22, 1983.

Patent application 527,066. E-Plane Hybrid Divider. Filed Aug. 29, 1983.

Patent application 528,386. Manchester Decoder Clock Multiplier. Filed Sept. 1, 1983.

Patent application 528,905. Hybrid Seal. Filed Sept. 2, 1983.

Patent application 529,788. Preparation of Hard Magnetic Alloys of a Transition Metal and Lanthanide. Filed Sept. 6, 1983.

Patent application 531,387. Low Temperature Deposition of Nickel Films. Filed Sept. 12, 1983.

Patent application 531,794. Fiber Optic Bundle Towed Array. Filed Sept. 13, 1983.

Patent application 532.122. High Speed Semi-Conductor Transistor. Filed Sept. 14, 1983.

Patent application 532,938. Method for the Deposition of High-Quality Single Crystal Epitaxial Films of Iron. Filed Sept. 16, 1983.

Patent application 533,334. Fluid Responsive Rotor Generator. Filed Sept. 19, 1983.

Patent application 534,477. Novel Antistatic Packaging Materials. Filed Sept. 21, 1983.

Patent application 535,085. Range Doppler Coupling Magnifier. Filed Sept. 23, 1983.

Patent application 535,488. Induced-Signal Capacitance Effect. Filed Sept. 26, 1983.

Patent application 537,474. An Active Circulator

Gyrotron Traveling Wave Amplifier. Filed Sept. 29, 1983.

Patent application 537,752. Signal Processor for Remote Optical Interferometric Sensors. Filed Sept. 30, 1983.

Patent application 538,298. Accumulation-Mode in 0.53^{Ga} 0.47^{As} Field Effect Transistor. Filed Oct. 3, 1983.

Patent application 538,300. Method for Preparing Semi-Insulating in 0.53^{Ga} 0.47^{As} Epitaxial Layers. Filed Oct. 3, 1983.

Patent application 538,461. Fabrication of Semiconductor Devices in Recrystallized Semiconductor Films on Electro-Optic Substrates. Filed Oct. 3, 1983.

Patent application 539,214. Front-End Processor for Narrowband Transmission. Filed Oct. 5, 1983.

Patent application 539,503. Frangible Fly Through Diaphragm for Missile Launch Canister. Filed Oct. 6, 1983.

Patent application 542,314. Portable Surfacing Machine for Boiler Manhole. Filed Oct. 14, 1983.

Patent application 542,926. Metal Oxide Remover and Method of Using. Filed Oct. 18, 1983.

Patent application 543,680. Frequency Multiplex System Using Injection Locking of Multiple Laser Diodes. Filed Oct. 20, 1983.

Patent application 546,252. Passivation of Steel with Aqueous Amine Solution. Filed Oct. 28, 1983.

Patent application 546,253. Automatic Vacuum Recyclable System for Chemical-Thermo Cleaning of Ship Tanks and Bilges. Filed Oct. 28, 1983.

Patent application 547,273. Fiber Optic Lever Towed Array. Filed Oct. 31, 1983.

Patent application 547,511. RF Components and Networks in Shaped Dielectrics. Filed Oct. 31, 1983.

Patent application 546,757. Integrated Optical Signal-Processing Devices Using Diffraction of Light by Magnetostatic Waves. Filed Oct. 28, 1983.

Patent application 548,541. Flexible Electro-Chemical Heater. Filed Nov. 3, 1983.

Patent application 552,513. Mass Spectrometer for the Analysis of Consecutive Ion Dissociations. Filed Nov. 16, 1983.

Patent application 554,664. In Situ Generation of Decontaminants. Filed Nov. 23, 1983.

Patent application 558,070. Multiplexed Digital Correlator. Filed Dec. 5, 1983.

Patent application 558,744. In-Line Optical Fiber Polarizer. Filed Dec. 7, 1983.

Patent application 559,557. Low Temperature Chemical Vapor Deposition System for Depositing Silicon Dioxide. Filed Dec. 8, 1983.

Patent application 559,576. Microprocessor Based Programmable Frequency Controller for Frequency Agile Radar. Filed Dec. 8, 1983.

Patent application 560,472. Polarization-Independent Switch with Coupler Spacing Optimized for Low Voltage Operation. Filed Dec. 12, 1983.

Patent application 561,843. In-Situ Machine for Refurbishing a Bore in a Workpiece. Filed Dec. 15, 1983.

Patent application 561,866. Polarization Preserving Single Mode Fiber Coupler. Filed Dec. 16, 1983.

Patent application 563,435. Fluorinated Polyesters. Filed Dec. 20, 1983.

Patent application 564,583. Method and Apparatus for Detecting Singlet State Resonance Fluorescence. Filed Dec. 22, 1983.

Patent application 566,080. Chemical Vapor Deposition and Reactive Diffusion of Boron on Beryllium. Filed Dec. 27, 1983.

Patent application 567,594. Semi-Conductor Laser End Facet Coatings for Use in Solid or Liquid Environment. Filed Jan. 3, 1984.

Patent application 568,962. Fluoroamine Curing Agent for Fluoroepoxy Resins. Filed Jan. 6, 1984.

Patent application 568,975. Telemetry Receiver Having Remote Tuning Capability. Filed Jan. 6, 1984.

Patent application 569,685. Efficient Adaptive Filter Bank. Filed Jan. 10, 1984.

Patent application 569,686. Resonant Photon Pumping Mechanisms for a Plasma X-Ray Laser. Filed Jan. 10, 1984.

Patent application 571,004. Submarime Precision Bubble. Filed Jan. 16, 1984.

Patent application 571,402. Oxidizing Reduced Ceramics. Filed Jan. 17, 1984.

Patent application 571,414. Demountable Coaxial Electrical Connector for In-Line Amplifiers. Filed Jan. 17, 1984.

Patent application 573,904. Dual Electrochemical System. Filed Jan. 26, 1984.

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PATENT NOTICES

Certificates of Correction for the Week of Oct. 23, 1984

Re. 31,436	4,425,346	4,447,541	4,453,031
Re. 31,596	4,425,399	4,447,636	4,453,194
D. 271,906	4,425,429	4,447,730	4,453,298
4,145,380	4,425,661	4,448,412	4,453,497
4,216,409	4,426,073	4,448,718	4,453,882
4,272,463	4,426,363	4,448,721	4,453,886
4,313,734	4,426,470	4,448,726	4,453,984
4,315,970	4,428,991	4,448,922	4,454,019
4,338,752	4,429,584	4,448,939	4,454,089
4,352,648	4,429,794	4,449,037	4,454,228
4,359,687	4,430,208	4,449,115	4,454,280
4,372,312	4,430,340	4,449,276	4,454,356
4,386,169	4,431,299	4,449,490	4,454,492
4,387,603	4,431,517	4,449,552	4,454,577
4,388,428	4,433,226	4,449,567	4,454,628
4,388,437	4,434,830	4,449,606	4,455,008
4,391,889	4,435,280	4,449,660	4,455,037
4,395,498	4,436,651	4,449,667	4,455,165
4,397,504	4,437,299	4,449,802	4,455,169
4,403,838	4,438,771	4,449,877	4,455,224
4,404,086	4,439,256	4,449,977	4,455,263
4,404,636	4,439,268	4,450,053	4,455,271
4,406,438	4,439,557	4,450,161	4,455,622
4,407,033	4,439,760	4,450,187	4,455,886
4,407,912	4,440,031	4,450,201	4,456,295
4,407,997	4,441,709	4,450,205	4,456,353
4,408,620	4,441,990	4,450,387	4,456,420
4,410,327	4,442,089	4,450,399	4,456,624
4,411,530	4,442,932	4,450,421	4,456,906
4,411,767	4,443,381	4,450,433	4,456,931
4,413,641	4,443,579	4,450,558	4,457,364
4,414,210	4,443,593	4,450,737	4,457,606
4,419,533	4,443,912	4,450,848	4,457,748
4,420,201	4,444,998	4,450,953	4,458,046
4,420,467	4,445,076	4,450,963	4,458,126
4,420,985	4,445,192	4,451,127	4,459,119
4,421,494	4,445,538	4,451,237	4,460,363
4,421,530	4,445,867	4,451,332	4,460,443
4,421,779	4,446,037	4,451,429	4,460,445
4,422,859	4,446,223	4,451,531	4,460,750
4,422,950	4,446,230	4,451,687	4,461,182
4,423,842	4,446,279	4,451,954	4,461,657
4,423,911	4,447,112	4,451,978	4,466,105
4,424,847	4,447,507	4,452,129	

Disclaimers

4,133,817.—*Gerhardus J. Lourens,* Rand Park Ridge Extn 1 and *Johannes M. Koekemoer,* Pretoria, both of South Africa. 11-OXA-PROSTAGLANDIN ANALOGS. Patent dated Jan. 9, 1979. Disclaimer filed July 23, 1984, by the assignee, *Hoffmann-La Roche, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,185,376.—*Richard Johnstone,* Brookfield, Wis. UNMANNED MACHINING CENTER WITH TOOL CHECKING. Patent dated Jan. 29, 1980. Disclaimed filed Aug. 27, 1984, by the assignee, *Kearney & Trecker Corp.*

Hereby enters this disclaimer to claims 6 and 7 of said patent.

Dedication

4,005,037.—*Fritz Mietzsch; Dietrich Hardt,* both of Cologne; *Volker Serini,* Krefeld; *Herbert Bartl,* Odenthal-Hahnenberg; *Hugo Vernaleken,* Krefeld, all of Germany. POLYCARBONATE-POLYVINYL CHLORIDE MOULDING COMPOUNDS. Patent dated Jan. 25, 1977. Dedication filed Aug. 27, 1984, by the assignee, *Bayer Aktiengesellschaft.*

Hereby dedicates to the public the entire term of said patent.

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Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
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	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
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Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
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Nevada	Reno: University of Nevada Library	(702) 784-6579
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New Jersey	Newark Public Library	(201) 733-7815
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
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	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-25-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-09-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	6-19-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-18-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-23-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	12-14-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-13-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	5-09-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-06-81
DESIGN, GROUP 290—K. L. CAGE, Director	2-22-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	3-12-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-18-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-30-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-04-82

Expiration of patents: The patents within the range of numbers indicated below expire during September 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,339,206 to 3,344,432, inclusive

Plant Patents ..... Numbers 2,764 to 2,769 inclusive

REEXAMINATIONS

OCTOBER 23, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,206,095 (264th)

PROCESS FOR PRODUCING PARTICULATE RESOLES FROM AQUEOUS DISPERSION

John Wynstra, Somerville, and Sidney J. Schultz, Cranford, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Reexamination Request No. 90/000,321, Jan. 24, 1983.
Reexamination Certificate for Patent No. 4,206,095, issued Jun. 3, 1980, Ser. No. 971,960, Dec. 21, 1978.
Continuation of Ser. No. 776,881, Mar. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 672,075, Mar. 30, 1976, abandoned.

Int. Cl.³ C08L *1/28, 5/00*
U.S. Cl. 528—137

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **31–35** is confirmed.

Claims **2, 5–9, 11, 13, 14, 16, 19** and **20** are cancelled.

Claims **1, 12, 27** and **28** are determined to be patentable as amended:

Claims **3, 4, 10, 15, 17, 18, 21–26, 29** and **30**, dependent on an amended claim, are determined to be patentable.

1. A process for producing a particulate solid, heat-reactive, substantially water-insoluble resole *having a maximum particle size of about 500 microns, a plate flow at 125° C. of at least about 18 mm., and that does not sinter on aging for at least 12 hours under a force of 100 pounds per square foot at 32° C.*, which process [comprises] *consists essentially of* the steps of:

(a) reacting formaldehyde, a phenol that is a trifunctional or tetrafunctional phenol or mixtures thereof, and an effective amount of an amine compound selected *solely* from the group consisting of hexamethylenetetramine, [a compound containing amino hydrogen,] *ammonia*, and mixtures thereof, in an aqueous medium in the presence of an effective amount of a protective colloid that exhibits protective colloid properties, *and is selected from the group consisting of gum arabic, and partially hydrolyzed polyvinyl alcohol*, at a temperature within the range of from about 70° C. to about 100° C., for a period of time sufficient to produce a particulate solid, heat-reactive, substantially water-insoluble, thermosetting resole that is dispersed in said aqueous medium but is separable therefrom in particulate form at the completion of the reaction whereupon the reaction mixture is cooled to a temperature below about 40° C.; and

(b) recovering said resole from said aqueous dispersion.

B1 4,355,572 (265th)

APPARATUS FOR SEPARATING THE PULP FROM THE SKIN OF FRUIT SUCH AS TOMATOES

Jesus A. Silvestrini, Mendoza, Argentina, assignor to IMDEC S.R.L., Mendoza, Argentina

Reexamination Request No. 90/000,459, Oct. 12, 1983.
Reexamination Certificate for Patent No. 4,355,572, issued Oct. 26, 1982, Ser. No. 253,373, Apr. 13, 1981.

Int. Cl.³ A23N *7/00*
U.S. Cl. 99—516

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

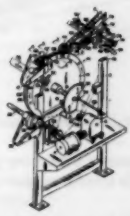
Claim **1** is determined to be patentable as amended:

Claims **2–12**, dependent on an amended claim, are determined to be patentable.

1. Apparatus for separating the pulp from the skin of fruit, such as tomatoes, which are supplied to the apparatus, comprising

carrying means *comprising a rotatably driven wheel rotatably* [rotatively driven and rotatively] mounted to said support frame;

gripping means, comprising mutually opposed members traveling around an endless *continuously* circular path *defined by said wheel*, supported by said *wheel* [carrying means] and interposed between supplied fruit and said *wheel* [carrying means], said *members* [gripping means] comprising resiliently deflectable *and substantially continuous flange means* [members] formed from a resilient synthetic resin and *having a generally V-shaped cross section extending radially outwardly of the periphery of*



said wheel [extending toward one another in the direction toward said carrying means], whereby is formed a trough for the gripping support of said supplied fruit by gripping the outer surface of the skin of each said supplied fruit on opposite sides of a plane extending through said fruit and for transporting said fruit along a first predetermined portion of said *continuously* circular path extending between a fruit receiving position and a pulp discharge position;

means positioned generally adjacent said gripping and transporting means, between said receiving position and said pulp discharge position, for producing a cut through a portion of said fruit skin remote from said gripping and transporting means and in a plane generally through the stem axis of the fruit;

means operatively mounted to said support frame and positioned adjacent said pulp discharge position for cooperating with the centrifugal force imparted by transport of the fruit around said *continuously* circular path for urging said pulp away from said gripping and transporting means through said cut in said skin while retaining said skin gripped thereby, whereby the pulp may be separated from the skin.

B1 4,377,886 (266th)

LINE TENSIONER

Steven T. Golden, 822 Teague Dr., Santa Paula, Calif. 93060

Reexamination Request No. 90/000,513, Mar. 22, 1984.
Reexamination Certificate for Patent No. 4,377,886, issued Mar. 29, 1983, Ser. No. 152,062, May 20, 1980.
Int. Cl.³ B65H 77/00
U.S. Cl. 24—71.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended:

Claims 2–5, dependent on an amended claim, are determined to be patentable.

1. A tensioning device for a flexible tension member such as a line comprising:

a body including a pair of sheave means, each [comprising] *having* a rod and flange means, the rods being parallel to one another and spaced to permit a line to pass therebetween[, and the flange means being spaced from the body]; and

a bracket carried by the body and projecting therefrom in a direction generally perpendicular to the plane containing the axes of said rods, including means forming a pivotal attachment point for tension means, said point being spaced from the plane and the pivotal axis being parallel to the rod axes[.],

the body being adapted to be rotated approximately 180° about an axis parallel to said rod axes between loose and tensioned conditions of the line, the line when in loose condition passing between said rods generally rectilinearly and when tensioned forming a figure 8 configuration around said rods, whereby the effective length of the line is shortened by at least twice the distance between said rods between loose and tensioned conditions.

REISSUES

OCTOBER 23, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

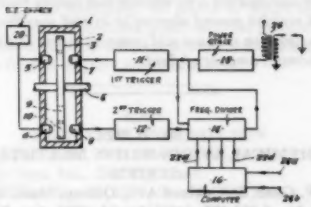
Re. 31,709
IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Eric H. Ford, London, England, assignor to Lumenition Limited, London, England

Original No. 3,981,282, dated Sep. 21, 1976, Ser. No. 321,660, Jan. 8, 1973. Application for reissue Sep. 18, 1980, Ser. No. 188,624

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—416 **10 Claims**



1. An electronic device for controlling the advance and retard of the ignition timing of an internal combustion engine in accordance with engine requirements, including means for generating a first series of square-wave voltage pulses in synchronism with the engine revolutions to provide a series of alternate first and second voltage levels; means for generating a second series of square-wave voltage pulses also in synchronism with the engine revolutions and at a fixed multiple of the first series of square-wave voltage pulses, so that the frequency of the second series of voltage pulses is greatly in excess of the frequency of the first series of voltage pulses; means for counting a *predetermined* number of the second series of voltage pulses from a [predetermined] point [in relation to the first series of voltage pulses,] *at which the logic level of the first series of pulses changes to the first voltage level,* the number of said pulses counted depending on the engine requirements; means for producing an output at the first voltage level from said counting means after said count has been completed; means for detecting the presence of both an output at the first voltage level from the first pulse generating means[,] and an output at the first level from the counting means [in order to initiate] *and, upon such occurrence, initiating* the production of a spark *and causing spark duration to begin* for the combustion of the fuel, *the outputs from both the counting means and the first pulse generating means remaining at the first voltage level until the logic level of the first pulse generating means changes to a second voltage level at a given engine crankshaft position and causes termination of spark duration*; and means for continuously varying the count of the counting means, so as to advance and retard the ignition timing in accordance with the requirements of the engine.

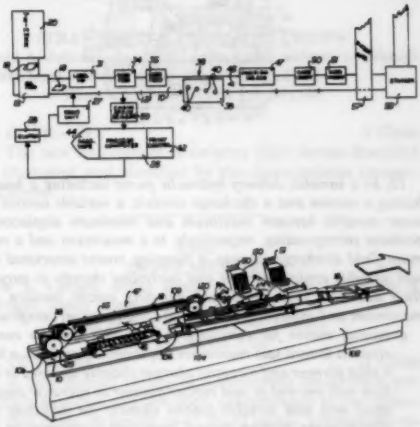
Re. 31,710
PERSONALIZED ON-LINE PRINTING AND INSERTING MAGAZINE BINDING MACHINE

Dale H. Jackson, Plattsburgh, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Original No. 4,149,711, dated Apr. 17, 1979, Ser. No. 865,944, Dec. 30, 1977. Continuation-in-part of Ser. No. 810,051, Jun. 27, 1977, abandoned. Application for reissue Feb. 26, 1980, Ser. No. 124,779

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—57 **22 Claims**



1. Apparatus for collating preprinted signatures and at least one card comprising

a station for processing preprinted signatures and cards,

conveyor means for moving preprinted signatures and cards past said processing station,

said conveyor means having a series of chain spaces each of which is adapted to receive either a printed signature or a card,

signature feeding means for feeding preprinted signatures into said chain spaces,

card feeding means for feeding cards into said chain spaces,

control means for controlling said signature feeding means and said card feeding means to withold a signature from and feed a card to one chain space and feed a signature to another chain space, and

means located downstream of said processing station for positioning a card that moved through said processing station from said one chain space into said another chain space having a signature located therein.

22. A method for collating preprinted signatures and at least one card comprising the steps of

providing a single linear series of consecutive spaces each adapted to receive a signature or a card,

moving said consecutive spaces in a single path,

withholding a signature from and feeding a card to one of said consecutive spaces and feeding a signature to another different consecutive space,

processing said signatures or said cards while they are moving in said single path, and

positioning a card from said one of said consecutive spaces into said another different consecutive space containing a signature.

Re. 31,711

VARIABLE DELIVERY HYDRAULIC PUMP

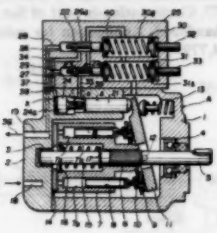
Takeshi Horiuchi, Ibaraki, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Original No. 4,072,442, dated Feb. 7, 1978, Ser. No. 700,953, Jun. 29, 1976. Application for reissue Mar. 16, 1979, Ser. No. 21,425

Claims priority, application Japan, Jul. 4, 1975, 50/82871; Mar. 15, 1976, 51/28458; Apr. 6, 1976, 51/38904

Int. Cl.³ F04B 1/26

U.S. Cl. 417—222 **14 Claims**



12. In a variable delivery hydraulic pump including a housing having a suction and a discharge conduit, a variable control element movable between maximum and minimum displacement positions corresponding, respectively, to a maximum and a minimum fluid discharge amount, a pumping means associated with said variable control element and controlled thereby to vary the fluid discharge amount of said pumping means between said maximum and minimum amount, the improvement comprising:

a biasing means for constantly urging said variable control element toward said maximum displacement position, a bore, a pilot plunger and a control plunger slidably disposed in said bore with one end of said control plunger in operative engagement with said variable control element for adjusting said displacement position thereof from said maximum to said minimum against the urging of said biasing means, said pilot plunger being slidable with one end thereof in engagement with the other end of said control plunger through a stroke distance to thereby move, engaged with said control plunger, said variable control element from said maximum displacement position to an intermediate displacement position between said maximum and minimum positions, to vary said fluid discharge amount from said maximum amount to a medium amount, said control plunger being slidable through a stroke distance to move said variable control element from said intermediate displacement position to said minimum displacement position to vary said fluid discharge amount from said medium amount to said minimum amount,

means for controlling the sliding movement of said pilot and control plungers including first and second spool valves each disposed for axial movement in a spool chamber, said first spool valve being movable independently of the position of said pilot plunger, each spool chamber having one end thereof in fluid communication with said discharge conduit of said pumping means, so that said spool valves will be exposed to the fluid discharge pressure of said pumping means, first and second push members disposed at the other ends of said first and second spool chambers for engaging the ends, respectively, of said first and second spool valves for urging said spool valves against the fluid discharge pressure from said discharge conduit, said first and second push members exerting different biasing forces on said respective spool valves so that said spool valves will each be caused to move against said respective push members in response to different fluid discharge pressures, a first control conduit for establishing fluid communication from a point intermediate the said ends of said first spool chamber, and thereby from said discharge conduit when said first spool valve is moved past said point towards its said other end, to the other end of said pilot plunger in said bore when said fluid discharge pressure exceeds a medium level to overcome the biasing force of said first push member, a second control conduit for establishing fluid communication from a point intermediate the said ends of said second spool chamber, and thereby from said discharge conduit when said second spool valve is moved past said point in said second spool chamber toward its said other end, to a point in said bore between said pilot and control plungers when said fluid discharge pressure exceeds a maximum level to overcome the biasing force of said second push member, the biasing force of said first and second push members being such that said spool valves will be moved thereby to close off said first and second control conduits from said fluid discharge conduit when said fluid discharge pressure is lower than said medium level whereby said biasing means will move said variable control element to its said maximum displacement position to cause said pumping means to discharge said maximum amount of fluid.

Re. 31,712

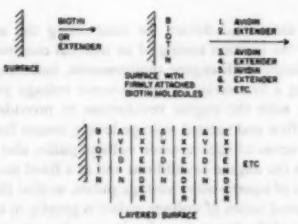
BIOCHEMICAL AVIDIN-BIOTIN MULTIPLE-LAYER SYSTEM

Roger W. Giese, 56 Oakland Ave., Quincy, Mass. 02170

Original No. 4,282,287, dated Aug. 4, 1981, Ser. No. 114,898, Jan. 24, 1980. Continuation of Ser. No. 374105, May 3, 1982,. Application for reissue Sep. 14, 1983, Ser. No. 532,037

Int. Cl.³ B32B 5/16, 9/00

U.S. Cl. 428—407 **28 Claims**



1. A process of modifying the surface properties of a surface, which process comprises:

applying alternative, monomolecular, successive layers of first and and second materials to a surface to be modified, the first material comprising avidin and the second material comprising a [noncovalent,] biotin-modified extender, one of the materials reacted to the surface, and, thereafter, at least one additional layer of each of the first and second materials alternated, secured and *noncovalently* reacted to the underlying layer, to provide a surface with the first or second material as the top surface layer thereon.

PLANT PATENTS

GRANTED OCTOBER 23, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,296

VARIETY OF APRICOT TREE

Frederick H. Hemenway, 8895 Winters Rd., Winters, Calif. 95694

Filed Jul. 15, 1982, Ser. No. 398,763

U.S. Cl. Plt.—39 1 Claim

1. A new and distinct variety of apricot tree substantially as described and illustrated which is characterized by large sized, early ripening, freestone fruit whose stones are not commensurate with the size of the fruit, and wherein the tree of said variety is large and spreading; the leaves of which are large, ovate, acutely pointed and dark green with red globose glands; further characterized by medium pointed buds that produce large white flowers slightly ahead of Royal.

5,297

PEACH TREE, BERENDA SUN

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Jan. 27, 1983, Ser. No. 462,991

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by its freestone fruit having a dark red color with bright yellow flesh of very firm and crisp character with a bright red rim bounding the pit cavity and by its skin which is tough and tenacious to the flesh, and ripening about July 22 through July 24.

5,298

AVOCADO TREE—'GWEN'

Berthold O. Bergh, Riverside, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 17, 1983, Ser. No. 467,613

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—44 1 Claim

1. The new and distinct varity of avocado tree herein described and illustrated and identified by the characteristics enumerated above.

5,299

AVOCADO TREE—'WHITSELL'

Robert H. Whitsell, Riverside, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 18, 1983, Ser. No. 467,627

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—44 1 Claim

1. The new and distinct variety of avocado tree herein described and illustrated and identified by the characteristics enumerated above.

5,300

STRAWBERRY PLANT—'JOE REITER'

Harold A. Johnson Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Mar. 2, 1983, Ser. No. 471,541

Int. Cl.³ AO1H *5/03*

U.S. Cl. Plt.—48 1 Claim

1. The new and distinct strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

5,301

STRAWBERRY PLANT—'THE CROWN'

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Mar. 2, 1983, Ser. No. 471,407

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—49 1 Claim

1. The new and distinct strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

5,302

CREPE MYRTLE

David E. Chopin, Baton Rouge, La., assignor to Chopin & Wright, Baton Rouge, La.

Filed Mar. 5, 1982, Ser. No. 354,952

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—54 1 Claim

1. A new distinct variety of *Lagerstoemia indica* plant substantially as shown and described, characterized by the distinctive pink color, its height up to 10–20 inches, substantially no vertical growth at full maturity, and a weeping growth habit at full maturity.

5,303

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,114

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—70 1 Claim

1. A new and distinct varity of miniature carnation plant, substantially as herein shown and described.

5,304

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,117

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—70 1 Claim

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

5,305

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,118

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—70 1 Claim

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

PLANT PATENTS

PATENTS

GRANTED OCT. 23, 1984

ERRATA

For CLASS	See PATENT NO.
073–040	4,477,986
446–177	4,477,998
446–470	4,477,999
200–144	4,478,347
384–482	4,478,463
604–890	4,478,596
430–009	4,478,639

PATENTS

GRANTED OCT. 23, 1956

TOOLS

No.	Name
[illegible]	PATENTED [illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

PATENTS

GRANTED OCTOBER 23, 1984

GENERAL AND MECHANICAL

4,477,927
BASEBALL GLOVE

Nobuyoshi Tsubota, Osaka, and Ichio Miyake, Kawanishi, both of Japan, assignors to Mizuno Corporation, Osaka, Japan

Filed Feb. 7, 1983, Ser. No. 464,666
Claims priority, application Japan, Feb. 8, 1982, 57-16916[U]
Int. Cl.³ A41D 13/10
U.S. Cl. 2—19 6 Claims

1. An improved baseball glove comprising:

a plurality of finger sheaths, each of said sheaths including a face member with first and second edges, two rear members each having first and second edges, means for joining said first edge of said face member to said first edge of one of said rear members, means for joining said second edge of said face member to said first edge of said other rear member the improvement comprising means for joining said second edges of said rear members to each other, said means for joining said second edges of said rear members to each other comprises an reinforcing strip overlapping onto said rear members, the second edges of said rear members being spaced from to each other and said elastic reinforcing strip being secured to the rear members along said second edges.

4,477,928
ELASTIC WITH EMBEDDED PULL CORD

Paul Graff, Encino, Calif., assignor to N.F.A. Corp., Chelsea, Mass.

Filed Apr. 8, 1983, Ser. No. 483,367
Int. Cl.³ A41D 1/14
U.S. Cl. 2—221 18 Claims

1. An elastic band comprising:

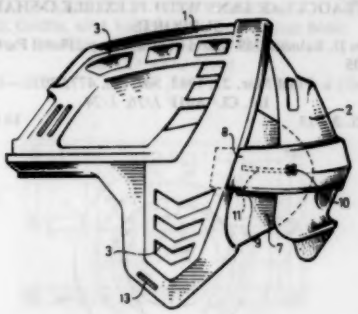
(A) an elongated web of material comprising interconnected elastic threads generally oriented in a longitudinal direction, said web being elastic in its longitudinal direction; and

(B) a pull cord extending in said longitudinal direction along a portion of said web, said cord being in the place of one of said elastic threads and having a length greater than the length in said longitudinal direction of said portion of said web in its unstretched condition, said pull cord being bunched at spaced intervals to allow said cord to be grasped and partially pulled out of said portion of said web.

4,477,929
PROTECTIVE HELMET

Stig Mattsson, Karlsholmsbruk, Sweden, assignor to Frosta Fritid AB, Gavle, Sweden

Filed Oct. 26, 1983, Ser. No. 545,708
Claims priority, application Sweden, Nov. 1, 1982, 8206205
Int. Cl.³ A63B 1/08
U.S. Cl. 2—425 8 Claims

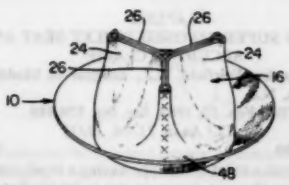


1. A one-piece protective helmet, particularly a helmet for ice-hockey and bandy players, which includes pivotally connected front and back integral parts which are arranged to be swung to different positions relative to one another and to be locked in said positions, so as to alter the size of said helmet, wherein the front part of the helmet forms the major part thereof and is provided with ear guards and means for attaching a chin strap, while the back part forms the minor part of the helmet and has the form of a basin-shaped neck guard which can be swung as a flap relative to the front part, about a substantially horizontal integral hinge means at the top of said neck guard; and the front and back parts are provided with mutually co-acting portions which, when the back part of the helmet is swung towards the front part thereof to shorten the distance between said parts and, thus, to shorten the length of said helmet, also cause the width of the helmet to be altered to a corresponding extent.

4,477,930
NATURAL TISSUE HEAT VALVE AND METHOD OF MAKING SAME

Robert P. Totten; Gail S. Totten, both of Denver, Colo., and Mary A. Wilson, San Jose, Calif., assignors to Mitral Medical International, Inc., Wheat Ridge, Colo.

Filed Sep. 28, 1982, Ser. No. 425,553
Int. Cl.³ A61F 1/22
U.S. Cl. 3—1.5 18 Claims



1. In a prosthetic heart valve wherein an annular stent having a base at an upstream end and upright posts at spaced circumferential intervals around the downstream end of said stent, the improvement comprising:

a one-piece fabric cover in the form of a tube having inner

and outer concentric folds with said stent inserted between said folds such that said posts are disposed at the juncture of said folds, a first inverted seam in said fabric cover along said downstream end of said stent, and a base seam joining said folds circumferentially along said upstream end;

a suture ring anchored to said base; and

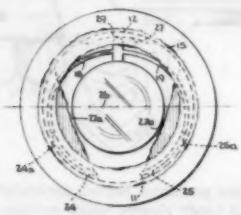
a tissue valve member circumscribing said stent and said outer fold.

4,477,931

INTRAOCULAR LENS WITH FLEXIBLE C-SHAPED SUPPORTS

Charles D. Kelman, 269 Grand Central Pkwy., Floral Park, N.Y. 11005

Filed Mar. 21, 1983, Ser. No. 477,020
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **10 Claims**



1. An intraocular lens with flexible support suitable for use as an artifical lens in the interior of a human eye, said eye interior having first and second groove portions extending peripherally at lower and upper portions of the eye when viewed in cross-section and having an iris disposed anteriorly of said groove portions, said lens comprising a light-focusing lens body, position fixation means extending from said lens body and comprising first and second support portions extending generally around substantially the entire periphery of said lens body, each of said first and second support portions being generally "C" shaped with the respective inner concave edges of the support portions facing each other and the outer generally convex edge of each of the support portions comprising at least one protruding contact point for seating each of the respective support portions in said first groove portion of the eye, said first and second support portions being resiliently deformable, in response to a force applied thereto prior to seating of the lens in the eye, and being capable of spontaneously returning toward substantially their undeformed condition upon removal of said applied force for seating said lens in the eye, said lens also comprising a stabilizing portion extending in a direction outwardly of said lens body toward said second groove portion of the eye without being seated therein.

4,477,932

RAISED SUPERIMPOSED TOILET SEAT AND SECURING CLAMP

Theodore Lenosky, Fairfield, N.J., assignor to Maddak, Inc., Pequannock, N.J.

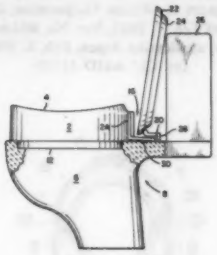
Filed Feb. 10, 1984, Ser. No. 578,849
Int. Cl.³ A47K *13/06, 13/12*
U.S. Cl. 4—239 **9 Claims**

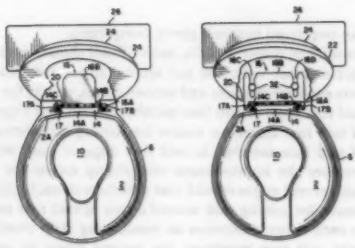
1. For use with a toilet of the type having a bowl, seat means, means coupling the seat means to the toilet so that the seat means can be lifted relative to the bowl, with a space being provided between the coupling means and the toilet when said seat means is lifted, in combination, a raised seat superimposed on the toilet and a clamp for securing said raised superimposed seat to the toilet, characterized by:

the raised seat including an upper portion which rests on the bowl, a lower portion which fits into the bowl and having a back which carries a rail;

the clamp including a first section which carries a track and a second section extending rearwardly from the first section;

the second section being received in the space between the





coupling means and the toilet so as to be captured therein, and the track of the first section engaging in sliding fit relation with the rail on the back of the raised seat; and

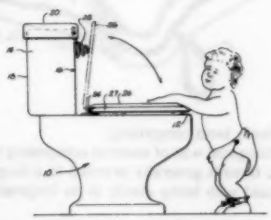
the first and second sections of the clamp thereby being in cooperative relation with the raised superimposed seat and the toilet, respectively, to secure said seat to said toilet.

4,477,933

TOILET SEAT CLOSURE

Franklin J. Leckie, 110 Parkdale Dr., Greenville, S.C. 29611

Filed May 23, 1983, Ser. No. 497,054
Int. Cl.³ A47K *13/00*
U.S. Cl. 4—253 **3 Claims**



1. A device for ensuring that a toilet seat cover extending over a seat of a toilet is in a lowered or closed position relative to the seat when said toilet is not being used comprising:

said toilet including,

(i) a bowl;

(ii) a water tank carried adjacent a rear potion of said bowl,

said tank having a front vertically extending wall with a tank cover extending thereover;

(iii) said seat being carried on said bowl;

(iv) a hinge connection securing said toilet seat cover to a rear portion of said bowl permitting said cover to be pivoted thereabout for raising and lowering said cover;

a coiled spring extending forwardly from said water tank for contacting said cover prior to said cover reaching a straight-up vertically extending position so that said cover must be manually held in the raised position; and

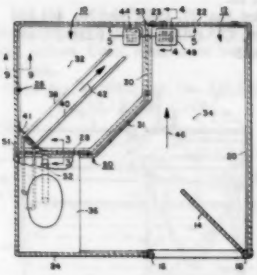
means for hanging said coiled spring on said water tank.

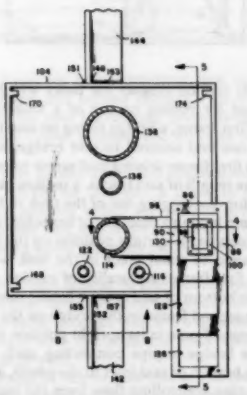
4,477,934

MODULAR BATHROOM INSTALLATION

Arthur H. Salminen, Waynesboro, Va., assignor to Hopeman Brothers, Inc., Waynesboro, Va.

Filed Mar. 24, 1983, Ser. No. 478,388
Int. Cl.³ A47K *4/00*
U.S. Cl. 4—663 **9 Claims**





1. A modular bathroom installation on a deck comprising:

means providing an enclosure having vertical side walls, an entrance opening, and a base supporting said vertical side walls from the deck, the base including means providing a floor for said enclosure;

means within said enclosure defining a shower stall;

barrier means preventing the flow of water from the part of the floor within the shower stall to the part of the floor outside the shower stall;

a wash basin within said enclosure, but outside the shower stall;

means for supplying water to the wash basin and to the shower stall;

a drain conduit connected to the wash basin;

a drain opening in said floor outside the shower stall; and

a drain opening in said floor within the shower stall; and

a trap;

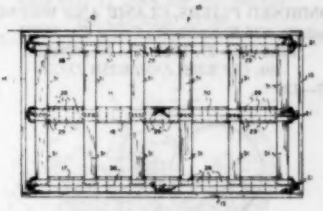
the base also including a receptacle positioned underneath the floor but above the deck, the receptacle being arranged to receive water flowing downwardly through both drain openings and through said conduit and to conduct water from said drain openings and said conduit toward said trap.

4,477,935

MATTRESS SUPPORT SYSTEM

Gordon D. Griffin, 4594 Victoria Cir., Provo, Utah 84601

Filed Jan. 8, 1982, Ser. No. 338,040
Int. Cl.³ A47C *23/06*
U.S. Cl. 5—241 **4 Claims**



1. A mattress support system comprising

a plurality of spaced apart, parallel elongate air springs, each of said air springs including

an elongate air filled, air impervious bladder,

a fabric sleeve surrounding said bladder and having multiple pockets extending over a longitudinal centerline at the outer surface of the sleeve, said pockets comprising means on the air spring for receiving and supporting ends of said slats; and

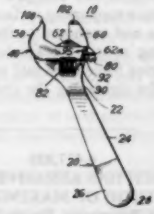
a plurality of slats extending between adjacent ones of the elongate air springs with each end of each slat extending into a pocket.

4,477,936

MULTIPURPOSE BICYCLE TOOL

Jerome L. Weston, 3134 Eastern Pkwy., Baldwin, N.Y. 11510

Filed Jan. 14, 1983, Ser. No. 457,932
Int. Cl.³ B25F *1/00*; B25B *13/10*
U.S. Cl. 7—139 **5 Claims**



1. A multipurpose bicycle tool having, in combination, a tire iron for dislodging a tire from the rim of a wheel, and a wrench for adjustment of brakes and hardware attachments of a bicycle frame, said multipurpose bicycle tool comprising:

an elongated handle member including an arcuate portion, a middle portion and an end portion having a flared edge, said end portion being adapted for slidable insertion between the bicycle rim and the tire, so that rotation of the

tool about the rim effects dislodgement of the tire from the rim;

a wrench extending from the arcuate portion of the handle member, said wrench being disposed in a direction which is angularly offset relative to the plane of the handle member, so that when the wrench is employed for adjustment of the brakes and hardware of the bicycle frame, the handle member is disposed outwardly of the bicycle frame, enabling unobstructed movement of the handle member relative to the bicycle frame; and

tire iron securing means for securing the bicycle tool in fixed relation relative to the bicycle wheel when the bicycle tool is used as a tire iron, said securing means including a groove positioned in the wrench, the groove being adapted for securing the bicycle tool to a spoke of the wheel.

4,477,937

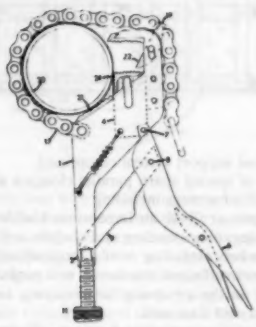
COMBINED PLIERS, CLAMP AND WRENCH

James Costello, 414 E. Smith St., Corry, Pa. 16407

Filed May 27, 1983, Ser. No. 498,854

Int. Cl.³ B25F *1/04*; B25B *13/52*

U.S. Cl. 7—139 3 Claims



1. A wrench comprising a first member having a first jaw at one end and a first hand grip at the other end, a second jaw between the ends of the first member slidably mounted on said first member for linear movement toward and away from the first jaw, a second member having at one end a first pivot to said second jaw and having a second hand grip at its other end, a toggle link extending from an adjustable abutment between the ends of the first member to a second pivot on the second member, said toggle link and said second member forming a toggle between said abutment and said second jaw for moving said second jaw toward said first jaw as the hand grips are squeezed, a workpiece supporting surface on said first member, a chain having one end anchored to the first member and its other end extending over a workpiece on said surface, and means for transferring force from said second jaw to the other end of the chain for tightening the chain against said workpiece.

4,477,938

MATERIAL WHICH HAS ABRASIVE PROPERTIES AND METHOD OF MAKING SAME

Samuel Rogut, 504 Bowenvale, Beach Rd., Cape Town, Cape Province, South Africa

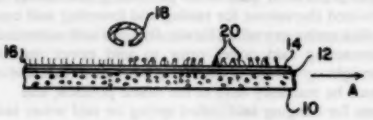
Filed Sep. 29, 1982, Ser. No. 427,711

Claims priority, application United Kingdom, Feb. 18, 1982, 8204816

Int. Cl.³ A47L *13/10*; B24D *11/02*; B32B *7/00*

U.S. Cl. 15—118 7 Claims

1. A method of manufacturing a material which has abrasive properties which method comprises fabricating a composite structure comprising a needle bonded fabric the fibres of which are of polypropylene or polyester, a backing layer of foamed synthetic plastics material and a knitted or woven fabric sandwiched between the foamed plastics material and



the needle bonded polypropylene or polyester, and applying heat to the exposed face of said needle bonded polypropylene or polyester to form hard abrasive nodules.

4,477,939

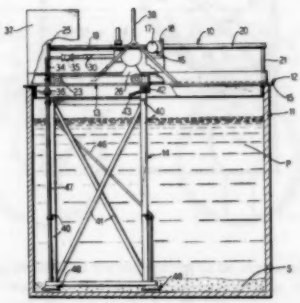
REMOVABLE SLUDGE CLEANER FOR TANKS

Harold R. White, New Lenox, and Alex J. Doncer, Palos Heights, both of Ill., assignors to Alar Engineering Corporation, Mokena, Ill.

Filed Jan. 27, 1983, Ser. No. 461,656

Int. Cl.³ B01D *21/24*; F22B *37/48*

U.S. Cl. 15—246.5 12 Claims



1. A portable suction cleaner for tanks which comprises a first frame sized for resting on top of a tank to be cleaned, tracks on said first frame, a bridge riding on said tracks, a drive screw having one end secured to said bridge, a nut actuator secured to said first frame driving said screw to reciprocate the bridge along the length of said tracks, a suction pump, an outlet for said pump for discharging out of the tank to be cleaned, an inlet to said pump having a plurality of branches, a second rigid frame fitting freely in an upright position on the bottom of the tank to be cleaned to stand erect in the tank when not connected to said first frame, a plurality of suction heads fixedly mounted on the bottom of said second frame, means releasably connecting the second frame to the bridge on the first frame to suspend the second frame in its upright position in the tank for travel with the bridge, a pipe connecting each suction head with a separate branch of said inlet to the pump, and a separate valve for each pipe controlling flow from the suction heads to the pump.

4,477,940

HEAVY DUTY WIPER ARM

Terry M. Will, Valparaiso, Ind., assignor to The Anderson Company of Indiana, Gary, Ind.

Filed Aug. 18, 1983, Ser. No. 524,379

Int. Cl.³ B60S *1/34*

U.S. Cl. 15—250.35 9 Claims

1. A windshield wiper arm assembly comprising:

a mounting head;

an outer arm section pivotally connected to the mounting head;

means on the outer end of the outer arm section adapted to support a wiper blade;

lever means having one end pivotally supported on the outer arm section and having the other end defining a pivot;

a link pivotally mounted on one end to the mounting head and pivotally connected on its other end to the pivot on said lever means; and

a tension spring connected at one end to a midportion of the outer arm section and connected at its other end to said pivot on said lever means;

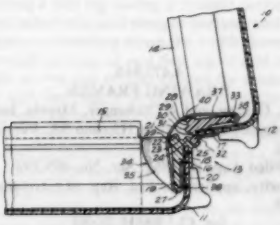
whereby the spring biases the outer arm section about the mounting head and toward the windshield.

4,477,941

SPRING LOADED LUGGAGE CASE HINGE

James S. Gregg, Aurora, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Jan. 8, 1982, Ser. No. 338,043
Int. Cl.³ E05D *11/06*
U.S. Cl. 16—289 **1 Claim**



1. Luggage hinge for interconnecting first and second opposed edges of first and second luggage case halves, respectively, such that the case halves may pivot about the opposed edged between a closed position and an open position, comprising;

a first hinge part affixed to the first opposed edge of the first case half having on one end a plurality of teeth with intervening grooves facing the second opposed edge of the second case half, said teeth and grooves being elongate and extending along generally parallel to the first opposed edge;

a second hinge part affixed to the second opposed edge of the second case half having on one end a plurality of teeth with intervening grooves which are dimensioned to mesh consecutively with the teeth and intervening grooves of the first hinge part;

only a first tooth of one of said first and second case halves meshing and in abutment with a first groove of another of said first and second case halves when the case halves are closed on each other, and consecutive meshing and abutment of other teeth and grooves occurring as the case halves are opening and thereby moving said hinge parts along a curved path, wherein only one tooth and one groove are meshing and in abutment at a time;

at least one generally C-shaped leaf spring having a central concave portion and with its ends secured to the first and second hinge parts on an end opposite to said one end to resiliently urge the hinge parts together, said first tooth and said first groove being spaced and in abutment with the central concave portion of the spring to provide two spaced stops with only a last tooth of said one of said case halves and a last groove of said another of said case halves meshing and in abutment when the case halves are in the open position, said spring thereby serving as a positive limit stop, said spring exerting at a predetermined constant force throughout movement of the luggage case halves from the closed position to a predetermined midway position, and between the predetermined midway position and the open position the spring exerts another constant force; and

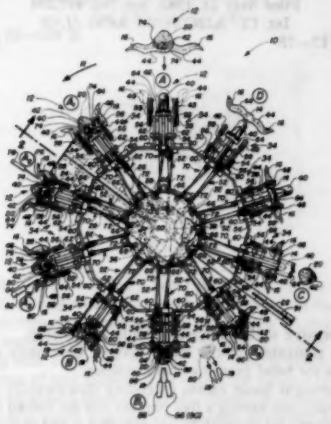
one of the case halves includes a pair of spaced upstanding walls, one at each side of the leaf spring.

4,477,942

POULTRY BREAST DE-BONING MACHINE AND PROCESSING METHOD

Eugene G. Martin, New Holland, and Dale M. Risser, Denver, both of Pa., assignors to Victor F. Weaver, Inc., New Holland, Pa.

Filed May 12, 1983, Ser. No. 493,924
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—11 **10 Claims**



1. A poultry breast de-boning machine powered by an adjustable speed drive motor connectably through a gear box adapted to intercommunicate by means of a chain sprocket drive train the transmittal and imparting of variably set rotary motion from said drive motor to a turntable drive shaft to in turn impart an adjustably set rotary displacement motion speed to an elevated horizontally disposed planar turntable having assembled thereto at regularly repeating arcuately spaced radial intervals a plurality of mechanically identical processing stations respectively adapted to receive by manually fed placement and support thereupon for arcuately displaced combined step-wise accomplishment of manual and mechanical breast de-boning processing operations a succession of forward bilateral poultry carcass sections at said adjustably set rotary displacement motion speed, said machine comprising in combination:

a. a support frame having interconnected vertical and horizontal members,

b. an infeed station location and a delivery station location respectively positioned at opposite radially disposed ends of said planar turntable,

c. a corresponding plurality of upward projecting truncated cone mandrel means respectively assembled one each upon outwardly projecting support means in turn respectively assembled one each at said regularly repeating arcuately spaced radial intervals of said horizontally disposed planar turntable and describing respectively said plurality of mechanically identical processing stations, and

d. a corresponding plurality of clamping jaws respectively assembled in a one each upward and outward projecting spatially related bilateral relationship set starting position relative to said upward projecting truncated cone mandrel means and operable by a first cam means to pivotally cycle simultaneously outward and downward operationally relative to said upward projecting truncated cone mandrel means during arcuately displaced rotary transit of said elevated horizontally disposed planar turntable at said adjustably set rotary displacement motion speed from the infeed station location to the delivery station location of said machine and thereafter pivotally cycle simultaneously upward and inward to said upward and outward projecting spatially related bilateral starting position upon completed arcuately displaced rotary transit return thereof upon said elevated horizontally disposed planar turntable to said infeed station location therefor.

4,477,943

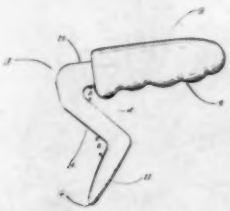
BIVALVE SHELLFISH OPENING KNIFE

Robert J. Grush, Jr., 3015 19th St., Metairie, La. 70002

Filed May 23, 1983, Ser. No. 497,294

Int. Cl.³ A22C *29/04*; A47G *21/06*

U.S. Cl. 17—75 **3 Claims**



1. A bivalve shellfish opening knife comprising:

(a) an elongated handle means having oppositely disposed ends for hand grasping therebetween;

(b) a straight blade means extending downwardly and forwardly, and having a free pointed end for forced insertion between said shellfish bivalve shells by, and in line with, a user's operating forearm, wrist and hand, and having oppositely disposed and spaced apart sharp edges that in side to side rotation is for opening said bivalve shells, and in forward and rearward motion for cutting said shellfish free from said shells; and

(c) connecting means integral with said blade means for fixing said blade means to said handle means, with said blade means being linearly offset forward from said handle means and aligned with said user's operating forearm, wrist and hand, and with both offset and alignment being in a common vertical plane for the linear application of all insertion force to penetrate between said shells of said shellfish, and for the increased leverage and efficiency resulting therefrom.

4,477,944

APPARATUS AND METHOD FOR OPENING A FIBER BALE

Rolf Binder, Raeterschen, and Daniel Hanselmann, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jul. 14, 1982, Ser. No. 398,185

Claims priority, application Switzerland, Jul. 15, 1981, 4624/81

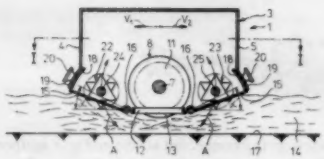
Int. Cl.³ D01G *13/00*

U.S. Cl. 19—80 R **13 Claims**

1. An apparatus for opening at least one fiber bale comprising

a fiber removal element mounted for to and fro movement at a predetermined speed over a given plane to penetrate into a surface layer of a fiber bale in said plane for removal of fiber therefrom;

at least one compression means disposed upstream of said fiber removal element relative to a direction of movement



thereof for compressing the surface layer of a bale in said plane; and

at least one advancing means near said compression means for extending into the surface layer of a bale in said plane with a given depth of penetration to advance the fiber material thereof towards said fiber removal element.

4,477,945

DRAWING FRAMES

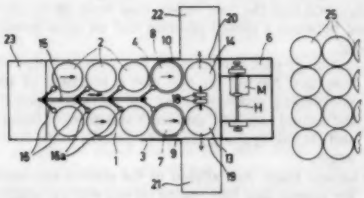
Louis Vignon, Geneva, and Alf Schopper, Meyrin, both of Switzerland, assignors to Heberlein Hispano SA, Vernier-Geneva, Switzerland

Filed Aug. 18, 1982, Ser. No. 409,292

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133438

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—236 **6 Claims**



1. A drawing frame comprising: a machine frame defining two can filling stations, two can removal stations with lateral outlets and a location for empty cans; a double draw head having devices for filling cans at the two filling station, each filling station being associated with a respective draw head; means for automatically replacing filled cans at the filling station with empty cans by rectilinear movement in the opposite direction to the working direction of the draw heads and for simultaneously, in the same rectinlear direction, moving the filled cans from the filling stations the the removal stations from which they can be expelled laterally from the machine frame; and control and drive apparatus for the drawing frame, the draw head, the can replacing means and the control and drive apparatus being disposed in the machine frame with the control and drive apparatus in line with the filling and removal stations whereby the grand plan of the machine is at least roughly rectangular in shape.

4,477,946

DEVICE FOR RECEIVING AND FIXING A FLOWER

Reinald Mafli, Urdorf, Switzerland, assignor to MAFAG AG fur Feinmechanik, Urdorf, Switzerland

Filed Dec. 16, 1982, Ser. No. 450,383
Claims priority, application Switzerland, Feb. 4, 1982, 671/82
Int. Cl.³ A45F 5/08
U.S. Cl. 24—5 3 Claims

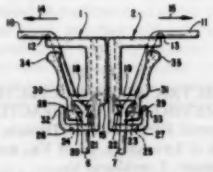
1. A fastening device to which a flower may be secured by a tape and which device may be pinned onto an article, said device comprising a body means including a head portion and an elongated shaft portion having a surface for supporting the flower stem, a safety pin fixed to said head portion, said safety pin comprising a first leg having a straight portion and an end portion bent relative to said straight portion, said head portion having a groove extending along the width thereof for receiving said straight portion of said first leg of said safety pin and having a slit at one end of said groove for receiving said end portion of said first leg, a plurality of projections extending into said groove for retaining said straight portion of said first leg therein to thereby hold said safety pin to said head, said elongated shaft portion being adapted to have a tape encircling it and a flower stem on it and said elongated shaft portion comprising a plurality of transverse ribs on the surface thereof that is opposite to the surface that supports the stem for preventing a tape that secures the flower stem to said elongated shaft portion from sliding therealong.

4,477,947

DRAWSTRING FASTENER

William J. Lyons, 9650 Mark Rd., Erie, Pa. 16509

Filed Jan. 13, 1983, Ser. No. 437,283
Int. Cl.³ F16G 11/14
U.S. Cl. 24—115 F 4 Claims



1. A fastener for releasably securing first and second ends of a drawstring for hoods or caps of children's clothing or the like comprising first and second parts, a detachable tension resisting connection between said parts, said first part being fixed to said first end, said second part having a molded plastic body with integral upper, lower and intermediate flanges with aligned openings in the flanges providing a way for receiving said second end of the drawstring,

a lever having its upper and lower ends adjacent said upper and lower flanges and having its intermediate portion with an integral connection to said intermediate flange, said intermediate flange and integral connection providing a resilient hinge of said lever to said body,

a gripping surface on said body opposite the lower end of said lever for engaging one side of said second end of said string, said lever having its lower end opposite said gripping surface and normally positioned to engage the side of said second end of the string opposite said one side and to be pivoted by said second end of the string against said gripping surface to grip said string by force exerted by said string in one direction on said one end of said lever to thereby prevent movement of said string relative to said body in said one direction,

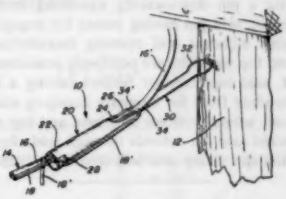
and means for pivoting said lever away from said gripping surface to permit intentional movement of said string relative to said body in said one direction.

4,477,948

DEAD-END MESSENGER WIRE HOLDER

Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval, Quebec, Canada H7W 1L3

Filed Mar. 21, 1983, Ser. No. 477,387
Int. Cl.³ F16G 11/00
U.S. Cl. 24—115 R 15 Claims



1. A device for holding a cable suspended from a support, said cable having an aerial support wire connected therealong for supporting same, said device comprising an open-ended tubular member having an inlet end and an outlet end for receiving said cable and support wire therethrough with an end portion of said support wire extending beyond said outlet end and separated from said cable, abutment means disposed adjacent said outlet end and substantially along the longitudinal axis of said tubular member for enabling said wire end portion to be bent adjacent said outlet end so as to extend exteriorly of said member in a direction towards said inlet end, wire retention means integral with said tubular member for enabling said wire end portion to be further bent and thereby secured to said tubular member and means for connecting said tubular member to said support such that said tubular member lies at a predetermined distance from said support, whereby said cable is indirectly held by said device via said aerial support having said end portion thereof secured to said tubular member.

4,477,949

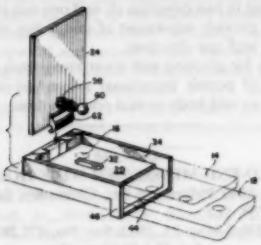
BELT BUCKLE CONSTRUCTION

Anthony S. Calabro, 51 Arbor Dr., Providence, R.I. 02908

Filed Apr. 18, 1983, Ser. No. 485,741
Int. Cl.³ A44B 11/00, 11/20
U.S. Cl. 24—180 11 Claims

1. A belt buckle for use with a belt strap having a first and a second end with said first end having at least one hole extending therethrough and said second end having a plurality of longitudinally spaced holes extending therethrough, said buckle comprising separate base and top members positively interconnectable with each other, said base member having a generally rectangular planar plate including opposite generally flat, upper and lower surfaces, said plate including an opening therethrough and wall portions at least including a rear end wall upstanding about said plate so as to form a seat for the terminal portion of said strap first end with said first end abut-

ting said rear end wall whereby said first end terminal portion is positioned in said seat with the hole of said strap first end and said plate opening aligned with each other, said plate lower surface being accessible to and adapted to receive said strap second end with the upper surface thereof in face to face contact with said plate lower surface with one of said holes thereof aligned with said plate opening and said one strap first end hole, said buckle top member including a generally planar



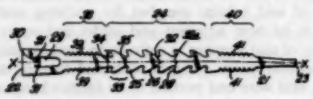
body having a pin downwardly extending from the lower surface thereof, said pin having means for engaging said base member plate adjacent said opening therethrough whereby said base and top members are positively positioned relative to each other, said top member further having a tongue rearwardly extending from for hingedly engaging said base member base wall whereby when said base and top members are interconnected said pin extends through said aligned holes sa as to position and clamp said belt strap ends therein.

4,477,950

CLOSURE

Kenneth E. Cisek, and Ewald A. Kamp, both of Chicago, Ill., assignors to Union Carbide Corporation, Old Ridgebury, Conn.

Filed Nov. 29, 1982, Ser. No. 444,979
Int. Cl.³ B65D *63/00, 77/10*
U.S. Cl. 24—30.5 P **16 Claims**



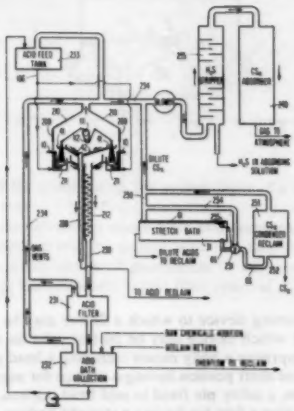
1. A closure comprising an elongated, pliable, resilient strip, having a first end, and leader end, two longitudinal edges between the first end and the leader end, and a longitudinal axis extending between the longitudinal edges; said strip having in a first zone on each longitudinal edge at least one projection defined by an edge portion oblique to the longitudinal axis and an abutment edge portion intersecting the oblique edge portion, said oblique and abutment edge portions on each longitudinal edge being respectively transversely aligned opposite the edge portions of the opposite longitudinal edge relative to the longitudinal axis so as to cooperatively form at least one arrow-head shape with the oblique edge portions converging towards the leader end; said strip having an aperture intermediate the first end and the first zone, and said strip having at least one pair of substantially longitudinally extending slits, wherein each of the slits of said pair is transversely aligned relative to the other slit of said pair and on opposite sides of the longitudinal axis, such that a portion of at least one slit of said pair engages a portion of the strip to provide a locking action when the leader end and at least one opposing pair of abutment edge portions are passed through the aperture and the strip is subjected to an elongation load.

4,477,951

VISCOSE RAYON SPINNING MACHINE

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Inc., Berwyn, Pa.

Filed Dec. 15, 1978, Ser. No. 969,727
Int. Cl.³ D02J *1/22*; D06F *3/00*
U.S. Cl. 28—246 **48 Claims**



1. Apparatus for spinning viscose rayon, comprising means forming an acid bath having enclosure means arranged for trapping and collecting any gases emanating from said bath, means for feeding an acid solution to said bath, a plurality of fiber-forming jet means disposed substantially along beneath the surface of said acid bath, means for forcing aqueous xanthated alkali cellulose in liquid form into said jet means and through said jet means into said bath, means for maintaining a low gas level in said acid bath, take-up means located within said enclosure means above said acid bath for taking up the resulting fibers in an upward direction within said enclosure means, means for delivering freshly spun fiber to a stretch bath, said stretch bath having means for reducing turbulence and controlling the flow of liquid relative to the direction of fiber travel, and take-up means associated with said stretch bath for removing the fiber from said apparatus.

4,477,952

PIEZOELECTRIC CRYSTAL ELECTRODES AND METHOD OF MANUFACTURE

Robert J. Crescenzi, Forest; John U. Daniels, Jr., and Gerald E. Roberts, both of Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Apr. 4, 1983, Ser. No. 481,834
Int. Cl.³ H01L *41/10*
U.S. Cl. 29—25.35 **3 Claims**

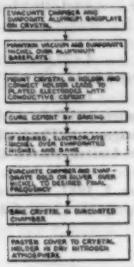
1. A method for providing electrodes on a piezoelectric crystal comprising:

a. depositing an aluminum baseplate on said crystal in a relatively high vacuum on at least a portion of a first surface of said crystal;

b. depositing a nickel plating on said aluminum baseplate before said aluminum baseplate is exposed to an active atmosphere and while said relatively high vacuum is maintained;

c. removing said crystal, with said aluminum and nickel

platings, from said vacuum and connecting leads to said nickel plating;



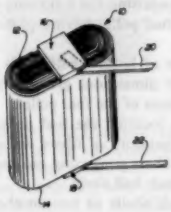
d. and depositing a frequency plating selected from silver or gold on said nickel plating in a relatively high vacuum.

4,477,953

WOUND CAPACITOR END CONNECTIONS AND METHOD OF OBTAINING SAME

Edward M. Lobo, New Bedford, and Donald F. Hunter, Wareham, both of Mass.

Filed Jul. 6, 1981, Ser. No. 280,924
Int. Cl.³ H01G *7/00, 1/14*
U.S. Cl. 29—25.42 3 Claims



1. A method of attaching an electrically conductive lead to an end of a tightly wound capacitor section having electrode windings exposed to said end, the method comprising: masking said end of the capacitor section to expose only a predetermined portion, spraying a first thin layer of liquefied conductive metal onto said predetermined portion, allowing said first conductive metal layer to solidify, positioning an electrically conductive terminal immediately adjacent to said first solid conductive metal layer, securing said conductive terminal to said first solid metal layer, spraying a second layer of liquefied conductive metal onto said predetermined portion superposed onto said first layer and said conductive terminal, and allowing said second layer of conductive metal to solidify.

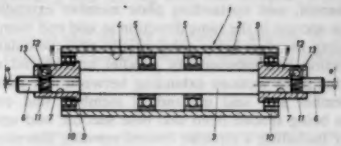
4,477,954

PRESSURE ROLLERS WITH LONGITUDINAL AXIS OF VARIABLE SHAPE

Bruno Molinatto, Montalto Dora, Italy, assignor to Componenti Grafici S.r.l., Turin, Italy

Filed Feb. 24, 1983, Ser. No. 469,525
Claims priority, application Italy, Mar. 3, 1982, 67239 A/82
Int. Cl.³ B21B *13/02*
U.S. Cl. 29—116 AD 4 Claims

1. A pressure roller having an axis of variable shape, in which an outer cylindrical jacket (2) is arranged coaxially on an inner shaft (3) with the shaft dynamically interlinked with the central part of the inner surface (4) of the said jacket (2) and provided in turn with two cylindrical end parts (8) received by the shaft (3) and dynamically interlinked each with one end of the inner surface (4) of said jacket, and with each cylindrical end part (8) being adjustably adjustable on a corresponding



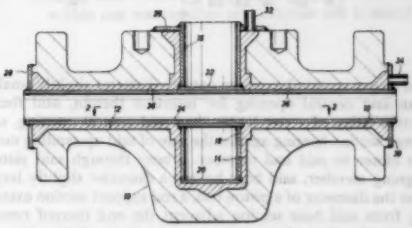
eccentric shaft (6) projecting axially and eccentrically from the corresponding end of the inner shaft (3).

4,477,955

METHOD OF PRODUCING A LINED STRUCTURE

James R. Becker; Edward L. Raymond, both of Houston, Tex., and David W. Cameron, Willowdale, Canada, assignors to Cameron Iron Works, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 138,874, Apr. 10, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 393,055
Int. Cl.³ B21D *53/00;* B21K *29/00;* B23P *15/26*
U.S. Cl. 29—157.1 R 11 Claims



1. The method of lining a body having a plurality of intersecting cavities including the steps of

nickel plating the walls of said cavities,

securing and sealing a thin hollow metal sealed structure within the intersecting body cavities in spaced relation to the walls of the cavities to provide an interconnected sealed space between said structure and the walls of said cavities with at least a portion of the thin hollow metal sealed structure blocking the intersecting body cavities,

filling said interconnected sealed space with metal powder,

evacuating gas from said interconnected sealed space,

subjecting the body with the sealed structure and metal powder therein to a temperature of approximately 2100° F. and a pressure of approximately 15,000 psi for a period of approximately two hours, to consolidate the metal powder into a dense uniform interconnected lining in said cavities,

cooling the lined body, and

machining the lined cavities to the desired dimensions and to remove the portion of the thin hollow metal sealed structure blocking communication between the body cavities.

4,477,956

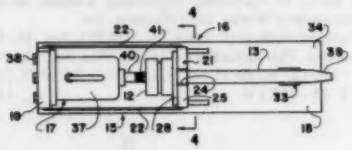
PISTON-REMOVING APPARATUS

Ray W. Mefford, P.O. Box 1162, Powell, Wyo. 82435

Continuation-in-part of Ser. No. 359,262, Mar. 18, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,730
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—252 5 Claims

1. Piston-removing apparatus including a frame portion, a piston-supporting portion, and an actuating portion; said frame portion including an elongated base section, said elongated base section having a generally rectangular configuration, an end plate member extending from adjacent one end of said base

section and substantially perpendicular thereto; said piston-supporting portion including an upstanding plate member disposed along the length of said base section intermediate the ends thereof, said upstanding plate member extending from said base section in the same direction as said end member, said upstanding member being substantially perpendicular to said base section and substantially parallel to said end member, connector plate sections extending between and joining said end member and said upstanding member, said connector sections being spaced from said base section, said upstanding member including a circular central opening therethrough, a channel of lesser size than said central opening connecting said central opening with the periphery of said upstanding member at a point remote from said base section, a cylindrical piston-aligning member removably engageable with said central opening in said upstanding member, said piston-aligning member including a sleeve section and a flange section, said flange section being disposed adjacent one end of said sleeve section,



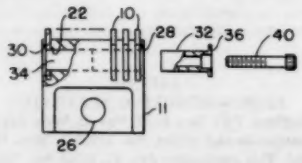
said sleeve section having an outside diameter slightly smaller than said central opening for insertion therein, said flange section being of a size larger than said central opening, said flange section bearing against the side of said upstanding member closer to said end member, a bore through said piston-aligning member, said bore having a diameter slightly larger than the diameter of a piston rod, a rod support section extending from said base section adjacent the end thereof remote from said end member, said support section including a cradle section at the free end thereof aligned with said central opening in said upstanding member; said actuating portion including expandable jack means with a base, said jack means being positioned between said end member and said upstanding member, said jack means having its base affixed to said end member and being spaced from said upstanding member; whereby inserting a piston rod through said central opening in said piston-aligning member with a piston thereon disposed toward said jack means and actuating of said jack means forces said piston rod from said piston.

4,477,957

METHOD TO REPLACE LOOPER ELEMENTS

Billy E. Inman, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 10, 1983, Ser. No. 456,628
Int. Cl.³ B22D *19/10*
U.S. Cl. 29—402.08 **2 Claims**



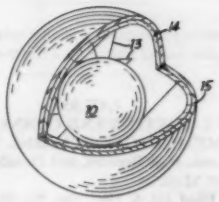
1. A method to remove and replace individual loopers of a tufing machine from a cast metal module containing a plurality of loopers having aligned openings therein containing cast metal comprising the steps of: drilling a hole transversely of the module to remove the metal in said openings therefrom to release the individual loopers in the module, removing and replacing the desired looper or loopers from the module, inserting a fastening member in the hole created by the drilling and the openings in at least the replaced loopers, and securing the fastening member in said drilled hole and openings.

4,477,958

MULTISHELL INERTIAL CONFINEMENT FUSION TARGET

James R. Holland, Butler, and Robert M. Del Vecchio, Vandergrift, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,286
Int. Cl.³ B23P *17/00*; G21B *1/00*
U.S. Cl. 29—423 **6 Claims**



1. A method for producing a multishell inertial confinement fusion target, comprising the following steps:

preforming a fuel pellet having preselected outside dimensions;

forming a pair of hollow half shells of sacrificial material having inner dimensions greater than the maximum outside dimensions of the fuel pellet;

concentrically locating the fuel pellet within the two half shells by a network of fibers within each half shell, the ends of the fibers projecting outwardly beyond the outer surface of each half shell;

joining the half shells to one another to enclose the fuel pellet;

smoothing the outer surface of the joint between the joined half shells;

coating the joined half shells with a self-supportive porous cover, the outer ends of said fiber supports being imbedded therein;

removing the sacrificial material comprising the joined half shells and depositing a gas-impervious coating over the porous cover.

4,477,959

METHOD AND DEVICES FOR CONSTRUCTING A SHACKLED CONVEYOR BELT FROM HELICAL ELEMENTS

Manfred Burnecke, Wettringen, Fed. Rep. of Germany, and Swen Nyman, Tyringe, Sweden, assignors to Jürgens Maschinenbau GmbH & Co. KG., Emsdetten, Fed. Rep. of Germany

PCT No. PCT/EP82/00042, § 371 Date Nov. 8, 1982, § 102(e) Date Nov. 8, 1982, PCT Pub. No. WO82/03097, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 3, 1982, Ser. No. 444,505
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3108522
Int. Cl.³ B23P *19/04, 11/02, 19/02, 21/00*
U.S. Cl. 29—433 **23 Claims**

1. Method for manufacturing a shackled conveyor belt from premade helical elements having alternately a left handed thread and a right handed thread, wherein the spires of adjacent helical elements are alternately pushed into each other

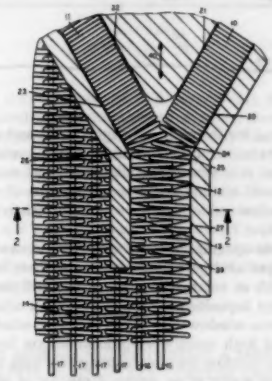
and a connecting wire is fed through each channel formed by the interlaced spires of adjacent helical elements, characterized in that

(a) pushing two each individual helical elements towards each other in their longitudinal direction at an angle to each other by means of a feeding air flow,

(b) parallelly deflecting the two helical elements in the area of their joining by alternating interlacing of their spires so as to form a joined pair of helical elements,

(c) pushing a front end of the joined pair of helical elements in a feeding direction by means of a feeding air flow at an acute angle to an associated end section of an end positioned helical element of the prepqred shackled conveyor belt,

(d) progressively pushing the spires of one of the two helical elements of the pair of helical elements from its end over



the width of the shackled conveyor belt between the opposing spires of the end positioned helical element of the shackled conveyor belt,

(e) inserting one connecting wire into each of two channels one of which is formed by the helical elements of the pair of helical elements, and another of which is formed by one of the helical elements and the end positioned helical element of the shackled conveyor belt.

7. Method in accordance with claim 1, characterized in that during the pushing of the spires of the one helical element of the pair of helical elements into the spires of the end positioned helical element of the shackled conveyor belt, the latter is pushed against the adjacent helical element of the shackled conveyor belt and the helical element of the pair of helical elements remote therefrom is supported until the engagement of the associated spires of its other helical element at all sides which are not facing the same.

4,477,960

METHOD FOR MAKING FERTILIZER CARTRIDGE

Philip B. Knapp, 40 Reyam Rd., Lynbrook, N.Y. 11563

Division of Ser. No. 144,851, Apr. 29, 1980, Pat. No. 4,340,179. This application Nov. 13, 1981, Ser. No. 321,242

Int. Cl.³ B29C *5/00*; B29D *31/00*

U.S. Cl. 29—458 **3 Claims**

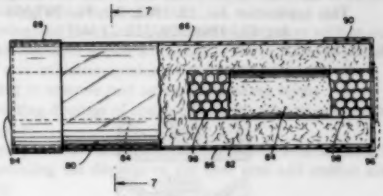
1. A method for manufacturing a cartridge for use with a lawn and garden feed apparatus in which said cartridge comprises a stable solid body of water insoluble but permeable hydrophilic gel containing a suspension of plant support reagent, and having a through longitudinal bore through which a stream of water is directed, into which water minute amounts of plant support reagents are released, said method comprising the steps of:

providing a mold,

adding a measured quantity of fertilizer, trace elements and Dowcil to a measured amount of water in a mixing pot and maintaining the mixture under constant stirring and at a temperature of approximately 140° F.,

continuing said stirring until said fertilizer is mixed in said water,

adding to said mixture a measured amount of gel and continuing said stirring until said fertilizer is suspended in said mixture,



adding to said mixture a measured amount of floc and allowing said floc to heat in said mixture under continual stirring until lumps are eliminated,

adding to said mixture a measured amount of calcium salt under continued stirring, and

pouring said mixture from said mixing pot into said mold within one minute after said calcium salt is mixed.

4,477,961

METHOD FOR MANUFACTURING A MEASURING CAPILLARY

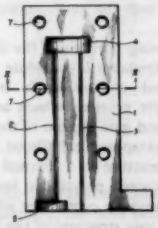
Tjeerd van Breest Smallenburg, Krimpen a/d Ijssel, Netherlands, assignor to Tjeba Holding BV, Netherlands

Filed Aug. 13, 1982, Ser. No. 408,033

Claims priority, application Netherlands, Aug. 17, 1981, 8103839

Int. Cl.³ B23P *25/00*; D03D *49/46*

U.S. Cl. 29—458 **5 Claims**



1. A method for manufacturing a measuring capillary which comprises: forming, in each of a number of substantially plate-shaped parts, a recess having such a shape that, when said plate-shaped parts are superposed, the recesses formed therein together define a capillary; coating the walls of the recesses and surface portions of the plates directlly adjacent thereto with a substance; superposing the plate-shaped parts so that the recesses formed therein together define a capillary; and connecting the plate-shaped parts to each other.

4,477,962

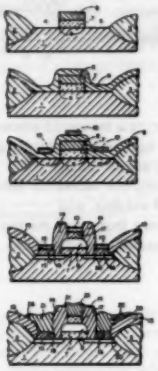
PROCESS FOR AND STRUCTURE OF HIGH DENSITY VLSI CIRCUITS, HAVING SELF-ALIGNED GATES AND CONTACTS FOR FET DEVICES AND CONDUCTING LINES

Gordon C. Godejahn, Jr., Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 909,886, May 26, 1978, Pat. No. 4,277,881. This application Jul. 12, 1982, Ser. No. 397,050

Int. Cl.³ H01L *21/225, 21/441*

U.S. Cl. 29—571 6 Claims



1. In a process for providing self-aligned gate, source and drain contacts to corresponding regions of a FET device structure formed on an exposed surface area of a substrate having first defined field oxide regions, said FET device having a gate structure including a dielectric layer on the exposed sufrace area of the substrate covered by a polysilicon gate electrode, the improvement comprising:

applying a layer of doped polysilicon having doping ions therein over the field oxide regions, the exposed surface area of the substrate, and the gate polysilicon electrode,

applying a layer of silicon nitride over the doped polysilicon layer,

delineating, using a single mask, silicon nitride outlined contact areas over the gates, sources, and drains of the FETs

selectively removing portions of the silicon nitride layer to expose the polysilicon layer while retaining said silicon nitride outlined contact areas overlying the doped polysilicon layer portions which are juxtaposed on the source, drain and gate regions of the FET device to protect the said juxtaposed polysilicon layer portions,

subjecting the structure to a thermal oxidation process to convert the exposed polysilicon layer to silicon dioxide and thereby produce cross-over silicon dioxide regions separating the gate structure of the FET device from the polysilicon layer portions juxtaposed on the source and drain regions of the FET device, and

subjecting the structure to a selective material removal process which removes nitride material without materially affecting non-nitride material, to remove the silicon nitride outlined contact areas and expose the underlying surface of the protected polysilicon portions, said exposed polysilicon surfaces affording self-aligned electrical contact areas for each of the source, drain and gate regions of the FET device.

4,477,963

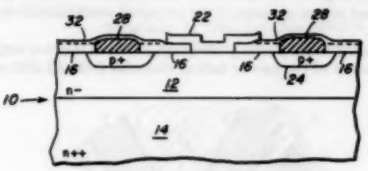
METHOD OF FABRICATION OF A LOW CAPACITANCE SELF-ALIGNED SEMICONDUCTOR ELECTRODE STRUCTURE

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 219,473, Dec. 23, 1980, abandoned. This application Feb. 17, 1983, Ser. No. 467,406

Int. Cl.³ H01L *29/46, 29/76*

U.S. Cl. 29—571 4 Claims



1. A method for forming self-aligned gate and source electrodes in a static induction transistor while avoiding the requirement for precision mask alignment and mask to mask registration, said method comprising the steps of:

growing a first oxide layer over a high resistivity epitaxial silicon layer on a semiconductor wafer;

masking and opening gate and source windows in said first oxide layer said gate windows in the form of elongated strips with an enlarged portion at one end thereof;

masking and depositing a protective silicon nitride layer in said source window and not in said gate window;

doping said high resistivity epitaxial silicon layer through said gate window thereby forming said gate electrode;

placing said wafer in an epitaxial reactor in which a low resistivity silicon layer of the same conductivity type as said gate electrode is grown over said wafer, said low resistivity silicon layer growing as a monocrystalline region over in the form of elongated strips with an enlarged portion at each end over said gate electrode and as a polycrystalline region over said first oxide layer and said silicon nitride layer;

exposing said wafer to a first etching solution which removes said polycrystalline region but which has little effect on said monocrystalline region;

growing a second oxide layer on said wafer under low temperature, high-pressure conditions;

exposing said wafer to a second etching solution which removes said silicon nitride layer from said source window without affecting said oxide layers;

doping said high resistivity epitaxial silicon layer through said source window thereby forming said source electrode;

masking and opening a gate contact window through said second oxide layer to said enlarged portion of said monocrystalline region; and

masking and depositing metal over said gate contact window and said source electrode for making electrical contact to said source and gate electrodes.

4,477,964

METHOD OF MAKING P-I-N PHOTODIODES

Aland K. Chin, Berkeley Heights, and Bulusu V. Dutt, Parsippany, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 402,921, Jul. 29, 1982, Pat. No. 4,443,809, which is a continuation of Ser. No. 154,046, May 28, 1980,. This application Oct. 3, 1983, Ser. No. 538,182

Int. Cl.³ H01L *29/161, 29/90, 27/14*

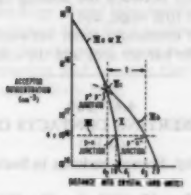
U.S. Cl. 29—572 8 Claims

1. A method of fabricating a photodiode (10) having a de-

pleted i-type active region (16) of a predetermined thickness bounded by a p-i type first junction (15) and an i-n second junction (17), comprising the steps of:

diffusing an acceptor into a low-doped n^--type semiconductor body (12) so as to form an anomalous diffusion profile (FIG. 3) of net impurity concentration versus depth therein, said profile including upper and lower monotonically decreasing segments (VIa and b) connected by an upwardly concave segment (VIc),

controlling the conditions of said diffusing step so that the



carrier concentration of said body (VII) is below that corresponding to said concave segment, thereby forming said first junction (15) at approximately the depth of said concave segment and said second junction (17) at a depth corresponding to the intersection of said lower segment (VIb) and the carrier concentration of said body, and

maintaining the difference in carrier concentration between that of said concave segment and that of said body so that said junctions are formed at depths separated by a distance essentially equal to said predetermined thickness of said active region.

4,477,965

PROCESS FOR MANUFACTURING A MONOLITHIC INTEGRATED SOLID-STATE CIRCUIT COMPRISING AT LEAST ONE BIPOLAR PLANAR TRANSISTOR

Lothar Blossfeld, Freiburg-Hochdorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,931

Claims priority, application European Pat. Off., Aug. 8, 1981, 81 106214.0

Int. Cl.³ H01L *21/26, 21/225*

U.S. Cl. 29—576 B **17 Claims**

1. In a process for manufacturing a monolithic integrated solid state circuit comprising at least one bipolar planar transistor having an emitter region on one side of a semiconducting substrate bordering a base region which is diffused into a collector region, the steps comprising:

inserting and diffusing dopants for said collector region into said surface side within said collector area by a masked implantation;

forming an oxidation masking layer portion over an emitter area;

depositing a photoresist mask defining a base area;

ion implanting a first dose of doping ions of a first conductivity type at a first accelerating energy such that said photoresist mask is penetrated but not said oxidation masking layer portion;

ion implanting a second dose of doping ions of said first conductivity type at a second accelerating energy sufficient to penetrate said photoresist mask and said oxidation masking layer portion at a second dosing, said second dosing being small relative to said first dose;

remaining said photoresist mask;

covering said base area outside said emitter area with an etch masking layer which is resistant to the etchings of material of said oxidation masking layer portions;

etching to remove said oxidation masking layer;

implanting dopings of the conductivity type of said emitter region;

carrying out base area diffusion and emitter area diffusion by activating the dopings of the base area and emitter area; and

wherein the order of said two ion implanting steps may be interchanged.

4,477,966

METHOD OF AND APPARATUS FOR WINDING AND INSERTING COILS IN SLOTS OF STATOR OR ROTOR LAMINATION ASSEMBLIES OF ELECTRICAL MACHINES

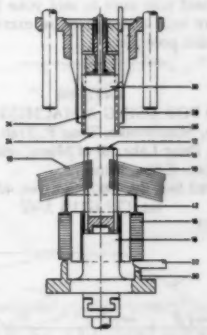
Reinhard Napierski, Niddatal, Fed. Rep. of Germany, assignor to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,794

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114407

Int. Cl.³ H02K *15/06*

U.S. Cl. 29—596 **20 Claims**



1. Method of winding and inserting coils in slots of a stator or rotor lamination assembly, the coils being producable on a former and transferable by means of a transfer tool onto an insertion tool for introducing said coils into said slots, said transfer tool comprising annularly arranged parallel bars, and said insertion tool comprising corresponding annularly arranged parallel insertion blades, cover strip blades, and an axially movable insertion ram, wherein in said method said bars of said transfer tool are caused to abut with the radially internal side of said insertion blades of said insertion tool during at least a part of the insertion operation, and are moved together with said ram.

4,477,967

METHOD FOR MAKING THE STATOR FOR ELECTRIC MOTOR

Susumu Yabuoshi, Toyota; Shogo Uzura, Okazaki, and Nobuyuki Hayashi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 284,950, Jul. 20, 1981, abandoned. This application Aug. 23, 1983, Ser. No. 525,792

Claims priority, application Japan, Jul. 24, 1980, 55-105561[U]

Int. Cl.³ H02K 15/02

U.S. Cl. 29—596 7 Claims

1. A method for making a pole of an electric motor, the stator comprising a cylindrical yoke and a pole core adapted to be secured to said yoke and having a pole piece which is curved in conformance to the curvature of the inner wall of said yoke, comprising the steps of:

(a) placing a sheet of an insulator on one surface of a conductor having a rectangular cross-section, the width of said sheet being greater than the width of said conductor, and forming said conductor and insulator into a coil of several turns so that said insulator is positioned between successive turns of conductors;

(b) folding all the oversized portions of said insulator of said turns;

(c) cementing the folded portions together;

(d) mounting said coil on said pole core; and

(e) securing said pole core to said yoke so that said folded portions are held under pressure exerted thereto by the yoke and said pole piece.

4,477,968

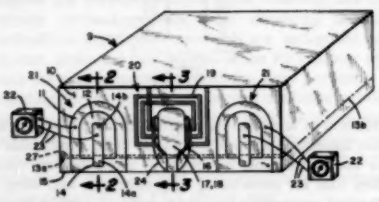
METHOD FOR USING A MACHINING SENSOR

Alan G. Kracke, Minnetonka; Tuan P. Tran, Bloomington, and Beat G. Keel, Prior Lake, all of Minn., assignors to Magnetic Peripherals Inc., Edina, Minn.

Filed Sep. 30, 1982, Ser. No. 430,193

Int. Cl.³ G11B 5/42

U.S. Cl. 29—603 2 Claims



1. In a method comprising the steps of depositing with a mask a feature formed of insulating material on a first surface of a machinable prism, machining a first edge of the first surface from an initial location toward a sensing line, and finally monitoring the output of a continuity tester, wherein said sensing line has a preselected spacing from the feature, said first edge is substantially parallel to the sensing line, and said feature is adjacent a conductive area on the first surface intersected by the sensing line, the improvement comprising the steps of:

(a) during the feature-depositing step, depositing a layer of the insulating material on the conductive area in a barrier area thereon lying along the sensing line and extending away from the initial location of the first edge;

(b) depositing a layer of conductive material within the boundaries of the barrier area on the insulating material and extending into and contacting the conductive area electrically only between the sensing line and the initial location of the first edge; and

(c) attaching the continuity tester between the conductive layer within the barrier area and the conductive area.

4,477,969

DEVICE FOR INSERTING CONTACTS ON A SUPPORT CARD

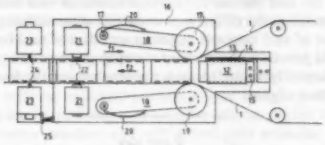
Aimé Cabaud, Velizy, France, assignor to Societe Comatel S.A., Rungis, France

Filed Jun. 29, 1982, Ser. No. 393,514

Claims priority, application France, Jul. 3, 1981, 81 13367

Int. Cl.³ H01K 43/00; H05K 3/30

U.S. Cl. 29—739 3 Claims



1. A device for inserting on a card for supporting a hybrid circuit or printed circuit, contacts connected together so as to form an assembly and each comprising, at one of their ends, a clip element oriented perpendicularly to the planes of the contacts and adapted to engage on the support card, said device comprising an elongate fixed card support, a frame which is mobile in a longitudinal direction of the support and on which are mounted in elastically mobile manner two rollers forming guide rollers for the contact assemblies, the clip elements of the contacts being at the level of a card on this support, a jack for displacing this frame, and means for alternately connecting the contact assemblies with the fixed support and with the mobile frame.

4,477,970

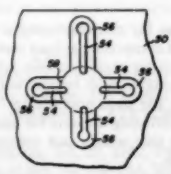
P.C. BOARD MOUNTING METHOD FOR SURFACE MOUNTED COMPONENTS

Robert P. Alexander, Schaumburg; Robert J. Pichia, Westchester, and Stephen F. Dauksch, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1982, Ser. No. 364,380

Int. Cl.³ H05K 3/30

U.S. Cl. 29—837 5 Claims



1. A method for preparing a printed circuit board for surface mounted components mounted in a component body hole in

the printed circuit board and having leads extending parallel to conductive lead contacts on the printed circuit board surface, the method comprising the steps of:

providing a printed circuit board having at least one body hole with a top surface for mounting said component;

metal lining said body hole to define a metal lined aperture;

metalizing said printed circuit board to define said conductive lead contacts;

positioning said conductive lead contacts into at least one hole such that at least one of said conductive lead contacts extends to the edge of and into said body hole; and

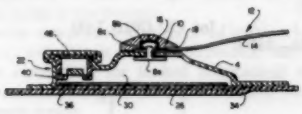
blanking a component body hold portion of the metal lined aperture such that the metal lining is cut away to provide isolated conductive lead contacts that extend to the edge of the component body hole.

4,477,971

IONTOPHORETIC ELECTRODE STRUCTURE

Stephen C. Jacobsen, Salt Lake City; Richard D. Luntz, Murray, and Barry K. Hanover, Salt Lake City, all of Utah, assignors to Motion Control, Inc., Salt Lake City, Utah

Division of Ser. No. 319,074, Nov. 6, 1981, Pat. No. 4,419,092.
This application Sep. 27, 1983, Ser. No. 536,304
Int. Cl.³ H01R 43/02
U.S. Cl. 29—877 1 Claim



1. A method of producing a bioelectrode comprising the steps of

placing a hollow conduit with a resilient plug fitted in the top thereof onto a mold whose upper surface is generally dome shaped, the lower end of the conduit including a blocking element which prevents a needle from passing all the way through the conduit, said conduit including openings which allow ion-containing solution to flow therethrough from the conduit,

placing a piece of vacuum formable material over the hollow conduit, plug and mold,

vacuum forming the material to the shape of the mold with the hollow condit and plug thereon,

removing the material and hollow conduit and plug from the mold,

attaching a conductive element to the material so that a first portion of the element is exposed to the area underneath the material and a second portion is exposed to the area above the material,

placing a cover of resilient material over the second portion of the conductive element, with one end of an electrical conductor sandwiched between the cover and second portion,

joining a membrane to the perimeter of the material to define an interior compartment between the membrane and the material, said membrane being adapted to allow the migration of ions therethrough when an ion-containing solution in the interior compartment is subjected to an electric field, and

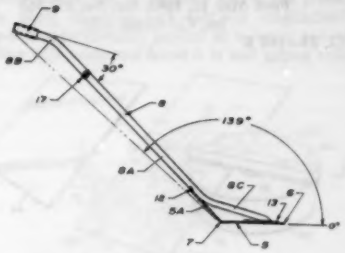
placing a protective cover over the underneath sides of the material and membrane.

4,477,972

TOOL FOR USE IN STRIPPING SHINGLES

Vincent M. Testa, Jr., Wakefield, Mass., assignor to Vinal Realty Trust, Wakefield, Mass.

Filed Jun. 14, 1982, Ser. No. 387,975
Int. Cl.³ A47L 13/02
U.S. Cl. 30—172 8 Claims



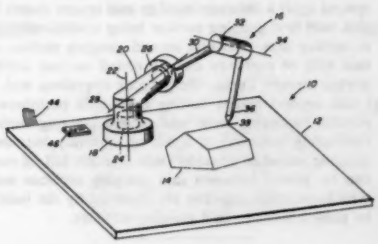
1. A tool for use in removing asphalt and wood shingles from a roof, said tool comprising a foot plate the front portion of which is flat and includes a transverse series of triangular teeth the points and notches between them rounded and an upwardly inclined rear portion, the junction of said portions establishing a transverse fulcrum and a handle of substantial length secured to the rear portion of said foot plate and to the flat front portion adjacent the series of teeth and said handle extending upwardly and rearwardly thereof with the handle and the flat front portion of said foot plate defining an included angle of approximately 135°.

4,477,973

THREE DIMENSIONAL GRAPHICS TABLET

David L. Davies, Guilford, Conn., assignor to Micro Control Systems, Inc., Vernon, Conn.

Filed Jul. 14, 1982, Ser. No. 397,976
Int. Cl.³ G01B 7/03
U.S. Cl. 33—1 CC 3 Claims



1. A three-dimensional graphics tablet comprising:

a support;

a contacting tip element; and

an articulated arm assembly connecting said contacting tip element to said support, said arm assembly comprising a first link element rotatably connected to said support for rotation about a first axis, a second link element rotatably connected to said first link element for rotation about a second axis, said second link element having two sections interconnected for relative rotation about a third axis, and a third link element rotatably connected to said second link element for rotation about a fourth axis, and further including first, second, third and fourth potentiometers for measuring the angles of rotation about the first, second, third and fourth axes respectively and for producing electrical signals responsive to said rotations, whereby said

signals collectively determine the coordinates of said tip element.

4,477,974

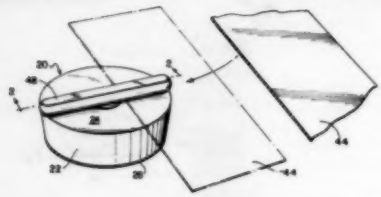
DEVICE FOR CHECKING BILLS OF CURRENCY TO DETECT BILLS WHICH ARE STUCK TOGETHER

E. Stanley Knochel, 4202 Glenmore Ave., Baltimore, Md. 21206

Filed May 12, 1982, Ser. No. 377,363

Int. Cl.³ G01B *3/38*

U.S. Cl. 33—168 R **13 Claims**



1. A device for checking bills of currency to detect bills that are stuck together, comprising:

(a) a base having a substantially flat lower face for supporting said device on a flat surface;

(b) said base being made of a heavy material to anchor said device in place when in use;

(c) said base including a first means providing a first gauging surface;

(d) a second means including a second gauging surface overlying at least a portion of said first gauging surface;

(e) spacer means disposed between said first and second gauging surfaces, said spacer means having a height at least equal to the thickness of a single bill of currency and less than the thickness of two bills of currency;

(f) a third means substantially centrally positioned in said base aligned with and cooperating with said spacer means and securing said second means to said base and positively fixing and locking said second gauging surface in parallel spaced relationship to said first gauging surface whereby said first and second gauging surfaces are maintained spaced apart a distance equal to said spacer means height; and, said first gauging surface being considerably greater in surface area than said second gauging surface so that said bills of currency can be rested on and stably supported thereby during the gauging operation: and,

(g) said second means having a beveled peripheral edge portion extending from said second gauging surface for facilitating insertion of a bill of currency between said gauging surfaces whereby only a single bill of currency can be passed between said gauging surfaces and bills which are stuck together are detected by the inability to be passed between said gauging surfaces.

4,477,975

ADJUSTABLE REMOTE CENTER COMPLIANCE DEVICE

Thomas L. De Fazio, Watertown, and Daniel E. Whitney, Arlington, both of Mass., assignors to The Charles Stark Draper Laboratory, Cambridge, Mass.

Filed May 22, 1981, Ser. No. 266,187

Int. Cl.³ G01B *5/25*

U.S. Cl. 33—169 C **38 Claims**

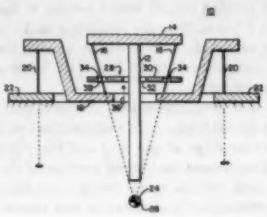
1. An adjustable RCC device having an adjustable remote center of compliance comprising:

a support member;

an operator member interconnected with said support member;

a mounting member spaced from said support member;

a plurality of radial members extending between and attached to said support member and said mounting member and having a focus at, near or beyond the free end of said operator member; and



means for moving at least a portion of said radial members toward and away from said operator member to shift the focus of said radial members.

4,477,976

CONTACT SENSOR

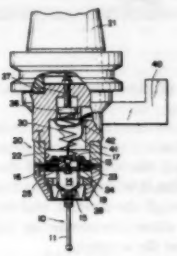
Sigeru Suzuki, Futtsu, Japan, assignor to Kuroda Precision Industries Ltd., Kawasaki, Japan

Filed Dec. 29, 1983, Ser. No. 566,700

Claims priority, application Japan, Dec. 29, 1982, 57-197243[U]

Int. Cl.³ G01B *7/00*

U.S. Cl. 33—169 R **8 Claims**



1. A contact sensor comprising:

a housing having an opening,

a movable probe having a hollow connector, a stylus fixed at one end of the connector and extended from the opening of the housing, and a flange provided at the other end of the connector with a supporting member,

a first electric contact provided on a center of the supporting member of the flange,

a fulcrum member provided inside of the housing freely to support the flange,

a bridge member provided under the flange through the hollow portion of the connector,

a second electric contact provided on a center of the bridge member to contact with the first electric contact,

a spring member provided in the housing to press the flange against the fulcrum for positioning the flange at a stable position relative to the housing, and

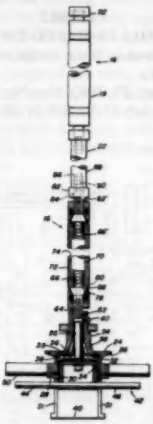
a detector provided on the housing to detect electric signals arisen due to separation and contact of both the electric contacts.

4,477,977

METHOD AND APPARATUS INVOLVING THE MEASUREMENT OF BORES

Richard W. Lusignea, Brighton; George J. Kirby, Allston, and Charles F. Mariano, Framingham, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Filed Oct. 8, 1982, Ser. No. 433,555
Int. Cl.³ G01B 5/12
U.S. Cl. 33—178 R 18 Claims



1. An apparatus for determining a nominal internal dimension, said apparatus comprising:

(a) expander means sized to be received within a bore whose nominal diameter is to be determined, said expander means constrained for limited longitudinal movement, said expander means including fluid-filled movable engagement means;

(b) drive means associated with said expander means for forcing the fluid into said engagement means and moving said engagement means in a substantially transverse direction into contact with the side of the bore whose nominal diameter is to be determined; and

(c) measurement means associated with said drive means for providing an indication of the displaced fluid volume required to move said expander means into full contact with the side of the bore, the fluid displacement volume related to the nominal diameter of the bore.

4,477,978

DIMENSION MEASURING APPARATUS

Kazuo Azuma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 9, 1983, Ser. No. 473,610
Claims priority, application Japan, Oct. 1, 1982, 57-150025
Int. Cl.³ G01B 7/00, 7/31
U.S. Cl. 33—180 AT 9 Claims

1. Apparatus for measuring the deviation of an axis of a locating hole in a surface of a workpiece being fabricated on a production line from a preselcted position with respect to a datum position on the workpiece that is spaced from said locating hole, without removing the workpiece from the production line, the apparatus comprising

a jig provided on the production line for registering with said datum point on the workpiece;

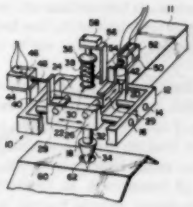
means for supporting the workpiece in a fixed predetermined position relative to said jig when the jig is in registry with said datum point;

a frame;

means for supporting the frame for movement toward and away from a gaging position having a fixed predetermined relation to said jig;

a probe having a longitudinal axis and an end portion centered on said axis and tapering from a diameter larger than said locating hole to an end substantially smaller than said locating hole;

means for coupling the probe to said frame for movement with respect thereto in two dimensions defining a plane perpendicular to the longitudinal axis of the probe, said probe being mounted such that the longitudinal axis thereof is approximately parallel to a center axis of said locating hole when said frame is in said gaging position;



means for resiliently urging the probe toward a first position with respect to the frame wherein the tapered end of the probe is extended from said coupling means; and

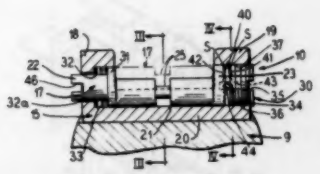
means for sensing a distance moved by the longitudinal axis of the probe in each of said two dimensions from a reference axis corresponding to said preselected position of the axis of the locating hole when the frame is in the gaging position, said gaging position being predetermined such that the tapered end of the probe will fully seat in a properly positioned locating hole of a workpiece when the workpiece is supported with the datum point of the workpiece in registry with the jig.

4,477,979

GUN SIGHT

William H. Oren, Rd. 1, Box 71, Northfield, Vt. 05663

Filed Jan. 13, 1983, Ser. No. 457,561
Int. Cl.³ F41G 1/28
U.S. Cl. 33—257 4 Claims



1. In an adjustable gun sight, having a sight frame for mounting on a gun barrel, said sight frame having spaced opposed cylindrical frame ends with an upwardly facing cut out concave frame portion extending therebetween in longitudinal alignment therewith, a rotatable cylindrically shaped sight pin supported by said frame ends, the sight pin having a centrally located eccentrically mounted sight surface between its ends, means for rotatably adjusting said sight pin, and click means for maintaining the sight pin in an eccentricall adjusted position, said sight pin having a collar adjacent to one end which collar is coactable with a shoulder on the corresponding tubular frame end to prohibit axial disengagement from the frame of the sight pin, the other of the opposed tubular frame ends having inside threads, and an adjustable plug engaged in threaded assembly with the threads of the said other tubular frame end for holding the sight pin against axial dislodgement

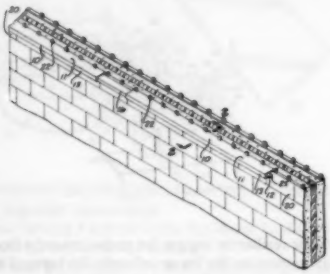
relative to the sight frame and for enabling the sight surface to be adjustably moved longitudinally of the frame, and spring means biasing the sight pin longitudinally toward said plug to provide a spring loaded adjusted position.

4,477,980

ALIGNMENT STRUT FOR WALL STRUCTURES

Christopher E. Jukes, Vancouver, Canada, assignor to Mod-Lok Industries Ltd., Vancouver, Canada

Filed May 6, 1983, Ser. No. 492,170
Int. Cl.³ G01C *15/10*
U.S. Cl. 33—404 3 Claims



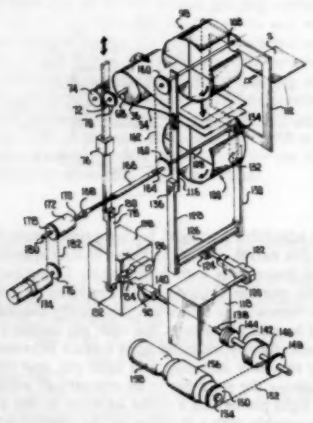
1. An alignment strut for prefabricated wall assemblies comprising a U-shaped beam structure having upper and lower legs of different lengths; the upper leg having an aperture adjacent its free end and a downwardly extending flange at its free end for engaging the upper portion of a margin of a wall assembly and the lower of said legs having a transverse portion engageable with the side of said wall assembly.

4,477,981

DYNAMIC DRYING SIMULATOR

Lawrence W. Chan, New City, N.Y., assignor to Royal E. Bright, New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,387
Int. Cl.³ F26B *3/20*
U.S. Cl. 34—41 20 Claims



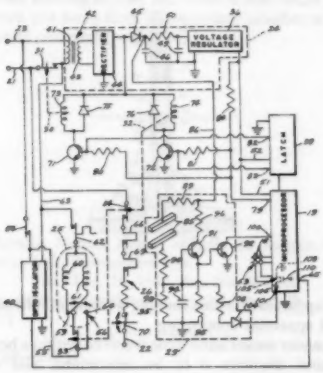
1. A method of simulating the drying action for the purpose of optimizing the operation of a dryer section of a paper machine, said method comprising the provision of two adjacent runs of dryer fabric, placing a test sheet between said dryer fabric runs, moving a first dryer into contact with a first surface of said test sheet and pressing a second and opposite surface of said test sheet against one of said dryer fabric runs, removing said first dryer from said test sheet, engaging said test sheet second surface with a second dryer and forcing said first surface of said test sheet against the other of said dryer fabric runs, removing said second dryer from said test sheet, and removing said test sheet for inspection.

4,477,982

MICROCONTROLLER-BASED DRYER CONTROL

Curran D. Cotton, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Sep. 27, 1982, Ser. No. 423,671
Int. Cl.³ F26B *21/06*
U.S. Cl. 34—48 18 Claims



1. A control for a fabric drying machine, comprising: selection means operable for initiating a fabric drying cycle including a dryness sensing operation; control means including microcontroller means having a plurality of terminals and operable for controlling said fabric drying cycle as initiated by said selection means; power supply means for energizing said control means; sensor means engageable with wet fabrics for completing an electrical current path therethrough; circuit means in circuit with said sensor means and said microcontroller means, said circuit means being operable for changing one of said terminals from a first to a second voltage state responsive to completion of said electrical current path and indicative of a dryness condition of said fabrics of less than a predetermined dryness; and counting means associated with said microcontroller means for accumulating a count of said changes in voltage state, said microcontroller means operable for initiating termination of said fabric drying cycle when said changes in voltage state fail to accumulate to at least a predetermined number in a predetermined sensing time period.

4,477,983

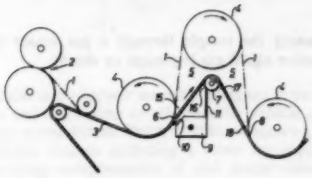
METHOD OF VENTILATING CYLINDER POCKETS IN A CYLINDER DRYER AND APPARATUS FOR CARRYING OUT THE METHOD

Karl-Hugo Andersson, and Nils Zinn, both of Växjö , Sweden, assignors to Flakt Aktiebolag, Nacka, Sweden

Filed Oct. 14, 1981, Ser. No. 311,463
Claims priority, application Sweden, Oct. 23, 1980, 8007440
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—114 2 Claims

1. Apparatus for ventilating cylinder pockets in a cylinder dryer including a plurality of heated cylinders about which a web-like material is taken in zig-zag mode, an endless Fourdrinier wire and return rolls positioned to press the material

against certain of the heated cylinder surfaces, cylinder pockets being formed between the cylinders, web and wire when the latter relinquishes contact with the web along a separation line at a cylinder surface, to pass over an intermediate return roll arranged between the cylinders, and to make contact once again with the web along a closing line at the next consecutive cylinder circumference, the separation effected by relinquishing contact in part producing spontaneous flow into the pocket through said wire and the closing action effected by making contact once again in part producing spontaneous flow out from the pocket, said inflow being normally greater than said outflow to produce an air current transverse to the web and exhausting beyond the edge of the web, said apparatus including at least one blowing box disposed adjacent said separation line outside the cylinder pocket extending over the width of the wire, and provided with blowing orifices placed between said intermediate return roll and the said separation line where



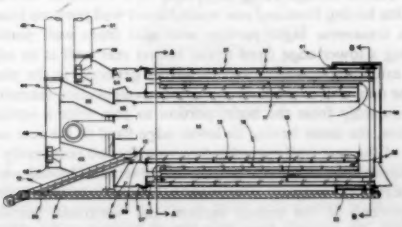
the wire relinquishes contact with the web, and barrier means on said blowing box comprising a lip of yielding material connected to the blowing box projecting outwardly therefrom with its free edge engaging against the peripheral surface of said intermediate return roll along its generatrix, at least some of the blowing orifices of the blowing box being directed such that drying air is caused to flow towards the wire in a direction forming an acute angle to, and in a direction substantially counter to the direction of travel of the wire, the flow through said orifices cooperating with said barrier means to create a reduction in pressure between said separation line and said intermediate return roll to reduce the spontaneous flow into the pocket relative to the spontaneous flow out from the pocket and thereby reduce the air current transverse to the web exhausting beyond the edge of the web, said barrier means also preventing an interface layer of wet air around the intermediate return roll periphery from being introduced into the cylinder pocket on rotation of the roll.

4,477,984

MULTI PURPOSE THREE PASS DRUM DRYER

Harvey Wenger, Holland, Mich., assignor to Wilfred O. Schmidt, Grand Rapids, Mich., a part interest

Filed Oct. 30, 1980, Ser. No. 202,113
Int. Cl.³ F26B *17/32*
U.S. Cl. 34—128 **7 Claims**



1. A rotary drum dryer comprised of
a plurality of concentric cylinders mounted for rotation about a horizontal axis defining,
a central chamber and a plurality of concentric ducts; the first and second duct, immediately radially outward of the said central chamber, are connected to communicate with each other and in turn connected to communicate in sequential order with the fourth radially outward duct; the said central chamber is connected to communicate with the third radially outward duct; paths of communication established are separate and distinct from each other,
a first and second stack means; the said first stack means is connected across the input of the said first duct and the input to the said central chamber thereby afford a selective communication by the input of the said first duct means either with the outside or with the input to the said central chamber; the said second stack means is connected to the unattached end of the said third duct to continue the communication of the said central chamber with the outside,
a burner means is mounted in the said central chamber,
a first and second blower means; the first blower means mounted in the said first stack means to pull air through the said first, second and fourth ducts in reverse sequential order and to push the air pulled either outside or into the said central chamber as determined by the first stack means; the said second blower means connected in the said second stack means to pull air from the said central chamber through the said third duct and push the air pulled outside,
a conveyor means mounted to introduce material to the input end of the said first duct,
a recycle auger means mounted to return material from the output of the said fourth duct to the said conveyor means,
a material movement means consisting of a deflecting and lifting means attached to the inner walls of each of the said first, second and fourth ducts which in combination with the unified rotation of the said ducts moves material a plurality of passes back and forth the length of the dryer,
wherein the evaporation of moisture of the material progressing through the dryer is absorbed by the counter circulating airstream directly proportioned to the amount of heat applied.

4,477,985

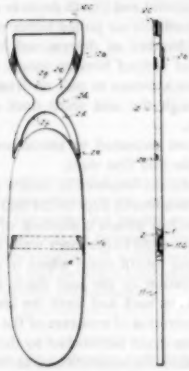
SANITARY SANDALS

Chen Yuan-Hsiang, No. 300 Chon-Chan Rd., Lui-Chou Hsiang, Taipei Hsien, Taiwan

Filed Jun. 3, 1982, Ser. No. 384,733
Int. Cl.³ A43B *3/12*
U.S. Cl. 36—11.5 **6 Claims**

1. A one-piece sandal made from a flat sheet of relatively soft resilient material, comprising a sandal body and a fastener, said body having a toe portion and a heel portion, said fastener having a front portion interlinked with a rear portion, said rear portion being integrally attached with said toe portion, the distal end of said fastener terminating in a belt, a groove molded transversely in the bottom of said body substantially midway between said toe and heel portions, a pair of crevices initiated from the outer periphery of the body and extending through the thickness of said body, each crevice being slanted inwardly toward the toe portion and disposed at the extremity of the groove, whereby said body and fastener are formed into

a sandal by bending the fastener over the top of the body and inserting the heel portion through the rear portion to enable



the placement of the belt into said groove and the placement of portions of the rear portion into said crevices.

4,477,986

METHOD OF, AND APPARATUS FOR, DETECTING LEAKS

Peter E. G. Marshall, Stratford-on-Avon; Francis R. Piper, Evesham, and John F. Wilson, Thornbury, all of England, assignors to BL Technology Limited, England

PCT No. PCT/GB82/00139, § 371 Date Dec. 16, 1982, § 102(e) Date Dec. 16, 1982, PCT Pub. No. WO82/03917, PCT Pub. Date Nov. 11, 1982

PCT Filed May 10, 1982, Ser. No. 456,039

Claims priority, application United Kingdom, May 8, 1981, 8114229

Int. Cl.³ G01N *3/20*

U.S. Cl. 73—40.7 **5 Claims**

1. A method of detecting the presence of a leakage path leading to the surface of a fabrication comprising the steps of:

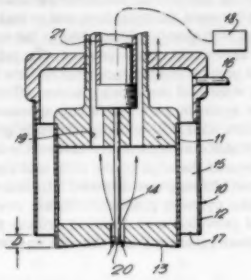
(1) positioning a shrouded sampler above at least part of a surface of a fabrication;

(2) providing a sample of signal gas to the end remote from the surface of a leakage path leading to the surface;

(3) establishing an air curtain between the sampler and the surface by an outflow of air from the sampler, the curtain serving with the sampler and the surface to define a sampling volume;

(4) adjusting the relative axial positions of members which define the air curtain to stabilize the air curtain and to maintain the gas pressure in the sampling volume at a level such that gas adjacent the surface passes to the sampler;

(5) withdrawing a sample of gas from the sampling volume by means of a probe incorporated in the sampler; and



(6) passing the sample through a gas sensor to establish whether signal gas is present or absent.

4,477,987

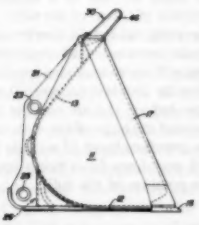
SPILL SHEET STRUCTURE ON LOADER BUCKET

Gary L. Stecklein, San Antonio, Tex., assignor to Deere & Company, Moline, Ill.

Filed Nov. 15, 1982, Ser. No. 441,358

Int. Cl.³ E02F *3/28*

U.S. Cl. 37—118 R **6 Claims**



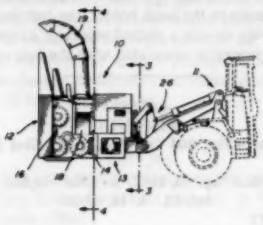
1. A spill sheet for a bucket having a rear upwardly and forwardly extending bucket wall terminating in an upper transverse horizontal edge, comprising: a main plate structure extending the full width of the bucket, including a central section having opposite transverse open ends and end sections extending outwardly respectively of said ends of said central section, said central section being composed of a U-shaped forward portion having front and rear spaced apart wall portions joined by a transverse bight portion with said front wall portion having a lower edge fixed to the bucket rear wall at its edge and extending upwardly and forwardly generally in the plane of the rear wall to the bucket, said rear wall portion extending downwardly from the bight portion to join with a vertical portion, the latter having its lower edge fixed to the rear surface of the rear wall spacedly downwardly and rearwardly of the upper edge of the rear wall, said end sections having vertical portions in outward continuations respectively of the vertical portion of the central section, and horizontal portions extending forwardly from the vertical portion to front horizontal edges fixed to the bucket rear wall at its said upper edge; and a pair of filler plates shaped to conform to the open ends of the central section and being fixed to the plate structure for closing said open ends.

4,477,988

MODULAR SNOW BLOWER ASSEMBLY

Paul-Eugène Vohl, 1738 Principale St., St-Marc des Carrières, Canada (G0A 4B0)

Continuation-in-part of Ser. No. 391,517, Jun. 24, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 552,813
Int. Cl.³ E01H 5/09
U.S. Cl. 37—250 4 Claims



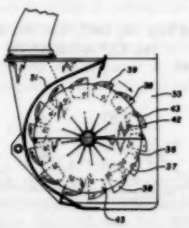
1. A modular snow-blower assembly designed to be attached to the front end of a tractor or other similar vehicle and comprising a rear motor module and a front snow-blowing module, said rear motor module including a frame for supporting a motor, operating independently of said motor vehicle, said front snow-blowing module comprising a housing, helical blades rotatably mounted in said housing and a blower rotatably mounted in the rear section of said housing, said blower adapted to evacuate the snow through an outlet duct, coupling means carried by the respective modules to readily and selectively couple and uncouple the modules relative one to the other, and a drive train for transmitting the power from the motor in the motor module to the helical blades and blower of the snow-blowing module and including first and second shaft portions respectively located in the rear and front modules, and means to couple and uncouple said first and second shaft portions concurrently with relative coupling and uncoupling of said housing and frame.

4,477,989

SNOWBLOWER AND SCARIFYING AUGER ASSEMBLY THEREFOR

René Vachon, 318A St. Raphaël St., Valleyfield, Canada J6T 3A6

Filed Jun. 13, 1983, Ser. No. 503,862
Claims priority, application Canada, Mar. 4, 1983, 422938
Int. Cl.³ E01H 5/09
U.S. Cl. 37—252 1 Claim



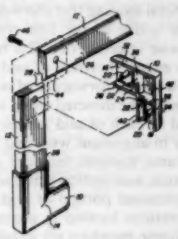
1. A scarifying snowblower blade assembly comprising a helicoid auger having an axis defining an operatively horizontal rotation axis and having an outer helical edge portion, said auger, upon rotation in one direction, moving the material engaged thereby in an axial direction along said axis towards one end of said auger, and scarifying teeth fixed to said helical edge portion serially along the latter, each tooth having a substantially flat radially inner portion which is secured flat against said helical edge portion and a radially outer edge portion which outwardly projects from said helical edge portion and which is laterally curved relative to said inner portion towards said axial direction, said teeth being closely arranged relative to each other along said helical edge portion, pivot means pivotally connecting each of the scarifying teeth to said helical edge portion, and a shearable element holding each scarifying tooth in operative position and located radially outwardly of said pivot means, said shearable element shearable upon impact of the corresponding tooth with an obstacle with the latter retractively pivoting relative to said helical edge portion to a retracted position laterally overlapping the next trailing tooth, each of said teeth including a leading edge and a trailing edge relative to said one direction of rotation, said leading edge and said trailing edge being wedged shape transversely of the tooth and in complementary direction relative one to the other to thereby permit said lateral overlapping movement of said tooth over the next trailing tooth.

4,477,990

PICTURE FRAME

Charles W. Buchanan, Scottsdale, Ariz., assignor to William Sornborger, Los Angeles, Calif.

Filed Jun. 8, 1982, Ser. No. 386,219
Int. Cl.³ G09F 1/12; A47G 1/06
U.S. Cl. 40—155 13 Claims



1. A picture frame comprising:

A. a plurality of edge members each having an aperture proximate each end thereof:

B. a plurality of corner members for coupling said plurality of edge members together to form said frame, each of said corner members comprising:

1. first and second channels perpendicular to each other for receiving therein ends of adjacent edge members; and

2. an internally threaded projection within each of said channels for passing through said apertures to secure said adjacent edge members to one of said corner members; and

C. screw means for threadably engaging said internally threaded projection from a second direction opposite said first direction.

4,477,991

FRAME FOR TRANSPARENCY FILM

Nolan A. Drevitch, South Easton, and Lawrence E. Green, Burlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

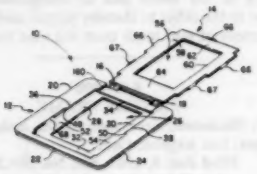
Filed Dec. 24, 1981, Ser. No. 334,087
Int. Cl.³ G09F 1/10
U.S. Cl. 40—158 B 14 Claims

1. A unitary frame for mounting a film transparency having a given width defined by spaced parallel sides, a leading end, and a trailing end, said frame comprising:

first and second frame members integrally connected to each other for movement between a film transparency loading position and an operative position wherein said frame

members are adapted to enclose and support a film transparency;

said first frame member includes means defining a recessed portion having a width substantially equal to the width of the transparency, an aperture, and a border surrounding said aperture, said border including spaced parallel sides having a maximum width therebetween substantially equal to the width of the film transparency, said parallel sides being adapted to support the parallel sides of the film transparency, said first frame member further includes a pair of longitudinally extending flanges having a length substantially less than that of said parallel sides of said border, said flanges further extend toward each other from opposite sides of said recessed portion and are spaced above said parallel sides of said border so as to



define therewith a pair of open-ended guides having a maximum lateral spacing therebetween substantially equal to the given width of the film transparency, whereby during end-wise insertion of a film transparency, its leading end may engage portions of said parallel sides of said border which extend forwardly of said open-ended recesses and thereafter be directed along said parallel sides into the open end of each of said guides thereby locating the transparency in alignment with said aperture; and

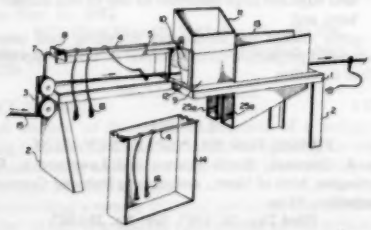
said second frame member includes a section having an aperture therein, said section being adapted to be received within said recessed portion of said first frame member, with said apertures located in alignment when said first and second frame members are in said operative position, thereby substantially enclosing the transparency.

4,477,992

APPARATUS FOR BAITING LONGLINE FISHING GEAR

Curtis E. Lang, 22340 - 132 Ave., Maple Ridge, B.C., Canada, and Robert J. Roe, Richmond, Canada, assignors to Curtis E. Lang, Vancouver, Canada

Filed Feb. 8, 1982, Ser. No. 346,901
Claims priority, application Canada, Apr. 10, 1981, 375164
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—4 **8 Claims**



1. Apparatus for use in association with baiting hooks attached by leaders to longline for deep sea fishing comprising:

(a) a receptacle for holding a plurality of pieces of bait;

(b) a bait longline separator means disposed adjacent the receptacle and extending substantially from one end of the receptacle to the other, the separator having therein a slot extending substantially from one end of the separator to the other;

(c) longline guide means for directing the longline along the side of the separator opposite the receptacle so that the leaders attaching hooks to the longline extend through the slot while the hooks at the ends of the leaders removed from the longline pass through the receptacle; and

(d) a bait catching receptacle located in line with the bait receptacle on the end opposite the end of the bait receptacle proximate to the hook holder, the bait catching receptacle having therein a slotted separator extension aligned with the separator associated with the bait receptacle.

4,477,993

FISH NET

James D. Woermbke, 304 2nd Ave., SW., Glen Burnie, Md. 21061

Filed Sep. 10, 1982, Ser. No. 416,566
Int. Cl.³ A01K *77/00*
U.S. Cl. 43—11 **9 Claims**

1. A fish net or the like having a removable cover comprising:

(a) a loop frame structure,

(b) a handle on said loop frame,

(c) a net attached to said loop frame,

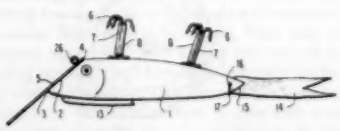
(d) a flexible, elastic cover having means for providing a first extended position substantially completely covering said net and loop frame and means wherein said cover is adapted to be movable to a second position wherein said cover is slidably retracted and contracted for uncovering said net and loop frame and being located adjacent to and substantially surrounding said handle.

4,477,994

ARTIFICIAL FISHING LURES

Stanton J. Erickson, 1259 Tall Pine Trail, Gulf Breeze, Fla. 32561

Filed Sep. 30, 1982, Ser. No. 430,342
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.44 **8 Claims**



1. An artificial fishing lure comprising

an elongated body member of buoyant material having a generally fish shape with a forward end and a rearward end, the forward end having a front face inclined from a leading edge at an angle of 40° to 55° to the longitudinal axis of the lure, the front face having means for attachment to a line, and the rearward end having an extreme

rearward end being adapted for the attachment of a flexible tail portion,

one or more hooks projecting upward from the dorsal surface of the body member and mounted external to the body member by inserting a shaft portion of each hook through a length of a hollow, flexible tube-shaped article approximately equal to the length of the shaft portion, passing a metal strap through an eye at the terminal end of the shaft portion and securing the ends of the metal strap to the body member to permit limited movement independent of movement of the body member but stabilizing the hooks to maintain the upward projection, and

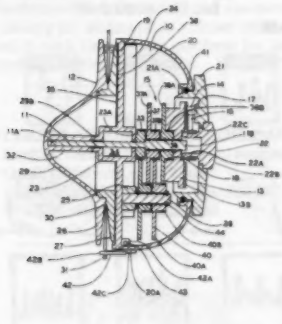
a weighted element attached to the underside of the forward portion of the body member.

4,477,995

LINE-MEASURING FISHING BOBBER

Larry L. Fenn, Lancaster, Ohio, assignor to Fenn-Niemann, Inc., Lancaster, Ohio

Filed Aug. 1, 1983, Ser. No. 519,060
Int. Cl.³ A01K *93/00*
U.S. Cl. 43—43.11 **6 Claims**



1. A line-measuring fishing bobber comprising:

(a) a housing;

(b) a rotative shaft extending into the housing;

(c) a line-engaging pulley secured to the shaft externally to the housing;

(d) an indicia-bearing gauge disposed within the housing and provided with a detent;

(e) means disposed within the housing in communication with the shaft and the gauge for driving said gauge in reduced proportion to the movement of the pulley; and

(f) a manually positionable index mounted on the housing and engagable with the detent for relatively nonimpeding movement therewith as the gauge is driven in one direction and disengagable as said gauge is driven in the opposite direction.

4,477,996

VARIABLE WEIGHT CASTING DEVICE

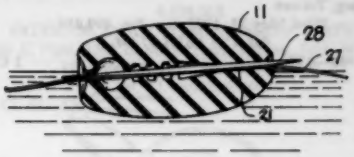
Richard Walter, 2951 Holiday Dr., Morgan Hill, Calif. 95037

Filed Apr. 12, 1983, Ser. No. 484,175
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—43.14 **9 Claims**

1. A variable weight casting device comprising,

a buoyant body having a longitudinal central bore defining a chamber, said chamber having openings to the front and back ends of said body for insertion of a fishing line therethrough, said bore having internal ribs extending radially inward in the inner wall of said chamber, and

a replaceable weight selected from weights with each having a different density, said replaceable weight being lodged in said chamber for retention of said fishing line by



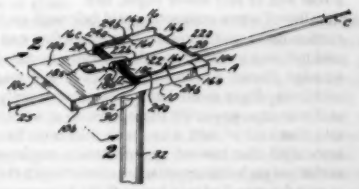
pressure of said weight on said ribs wherein the buoyancy of said device is affected.

4,477,997

ELEVATED WIRE SUPPORTED RODENT TRAP

Kie Bumgarner, 4230 Myrtle Ave., Long Beach, Calif. 90807

Filed Feb. 16, 1983, Ser. No. 466,920
Int. Cl.³ A01M *23/30*
U.S. Cl. 43—58 **1 Claim**



1. The combination with a rodent trap of the type that includes a rectangular rigid base that has top and bottom surfaces, a spring loaded assembly mounted on said top surface for ensnaring a rodent, said assembly including a movable trigger on which bait may be placed to entice a rodent to move said trigger from a first to a second position, said trigger when moved to said second position either by a rodent nibbling on said bait or walking over said trigger actuating said assembly to ensnare the rodent causing said actuation, and a mounting for said rodent trap on an elevated wire on which a rodent may walk, said mounting including:

a. an elongate rigid strip permanently secured to said bottom surface;

b. a socket that extends downwardly from said strip;

c. a pair of longitudinally spaced legs that depend from said strip and are located on opposite sides of said socket and laterally spaced from the latter; and

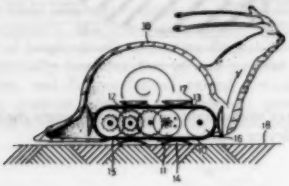
d. a pole of substantial weight and length removably mounted in said socket, said pole serving the dual function of allowing said trap to be elevated to above said wire and then lowered relative to said wire for a longitudinal portion of said strip to rest on said wire with said socket and legs disposed on opposite sides of said wire, with the weight of said pole preventing said trap pivoting transversely relative to said wire, and said pole permitting said trap to be disengaged from said wire and lowered to the ground after a rodent has been ensnared in said trap by moving said trigger to said second position.

4,477,998

FANTASTIC WALL-CLIMBING TOY

Yun-Long You, No. 16 Tien Shin Rd., Fong Yuan City 420 Taichung, Taiwan

Filed May 31, 1983, Ser. No. 499,454
Int. Cl.³ A63H *11/04*
U.S. Cl. 446—177 1 Claim



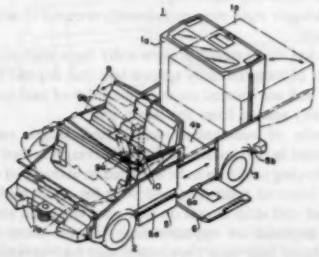
1. A wall climbing toy comprising:
an outer body, having front and rear ends,
a drive mechanism disposed within said body, said drive mechanism comprising:
an endless belt having an upper flight and a lower flight,
a plurality of suction disks mounted on said belt for contacting a surface,
a drive motor,
speed reducing gear means drivingly interconnecting said motor and said endless belt for rotating said belt to bring said suction disks into contact with a surface at a front end of said lower flight when said body is driven forwardly, and to pull said suction disks from the surface at a rear end of said lower flight, and
a plurality of wires connecting said belt with each of said suction disks, said wires each having a first end fixed to said belt and a second end fixed to an associated disk at an edge thereof which first arrives at said rear end of said lower flight as the latter moves rearwardly, to pull said rear edge upwardly in response to upward travel of said first end of said wire, each said wire bending its associated disc toward an orientation confronting the surface as such disk approaches contact with the surface at said front end of said lower flight to promote adherence with the surface.

4,477,999

TRANSFORMABLE TOY VEHICLE

Akinori Harigai; Shinichi Aoki, and Takehisa Nakayama, all of Tokyo, Japan, assignors to Kabushiki Kaisha BANDAI, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,476
Claims priority, application Japan, Mar. 10, 1983, 58-39901
Int. Cl.³ A63H *11/10*
U.S. Cl. 446—470 2 Claims



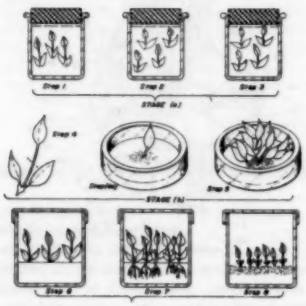
1. A transformable toy vehicle comprising:
a chassis comprising front and rear chassis slidably engaged with each other for extension and contraction along the longitudinal direction of said toy vehicle;
a rear body of said toy vehicle mounted on said rear chassis for turning upside down and reversing front and rear faces to assume different outer appearances for top and rear faces and for bottom and front faces, respectively, said rear body being formed with guide grooves at both side faces thereof for engagement with guide pins mounted on said rear chassis, and said rear body being capable of being moved along the entire length of said guide grooves and being turned upside down at the extremeties of said grooves about said guide pins; and
a seat member mounted generally centrally on said rear chassis for moving vertically and horizontally relative to said rear chassis.

4,478,000

PROCESS FOR STIMULATING ASEXUAL PROPAGATION OF *SIMMONDSIA CHINENSIS* TISSUE

Zachary S. Wochok, Manchester, Mo., and Carolyn J. Sluis, Davis, Calif., assignors to Plant Resources Institute, Salt Lake City, Utah

Continuation-in-part of Ser. No. 230,014, Jan. 30, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,378
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 16 Claims



1. A process for initiating mass propagation of plant tissue from undifferentiated *Simmondsia chenensis* plant tissue comprising the steps of, sterilization of the donor tissue; pretreatment of said tissue with a solution containing a cytokinin that is N_6-benzyladenine; placing and culturing said treated tissue on a first culture medium appropriate to support and promote tissue growth under appropriate conditions of temperature and light; further culturing the tissue on a second culture medium compatible with the pretreatment step to promote additional tissue growth and shoot development; separating the developed tissue into individual shoots; placing and culturing said shoots on a shoot multiplication medium; separating the multiplied shoots into individual shoots for development on a root initiation medium into plantlets; and transplanting the plantlets into a soil mix.

4,478,001

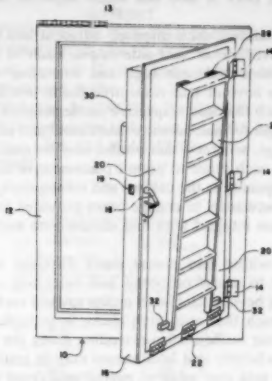
PROTECTIVE ENTRANCEWAY

Tanai N. Hogan, Orlando, and James A. Woods, Winter Park, both of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 22, 1981, Ser. No. 275,571
Int. Cl.³ E06B *7/00*
U.S. Cl. 49—37 7 Claims

1. For use in connection with a shelter means, a novel compound door hinged about an essentially vertically disposed hinge line, said compound door being usable in one mode as an ordinary door, and in another mode as part of a protective

entranceway, a platform normally serving as a portion of the exterior of said door, and capable of being lowered at the option of the user from an essentially vertical position, into an



essentially horizontal position such that it can serve as a walkway, and a canopy for utilization as a closed entranceway over said platform at such time as said platform has been lowered into the essentially horizontal position.

4,478,002

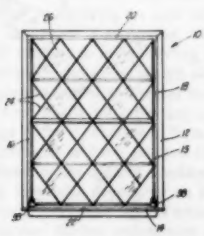
INTERIOR SECURITY WINDOW PANEL

Thomas A. English, Oklahoma City, Okla., assignor to Interior Security Corp., Oklahoma City, Okla.

Filed Sep. 30, 1982, Ser. No. 430,347

Int. Cl.³ E06B *3/68*

U.S. Cl. 49—57 **2 Claims**



1. An interior security window panel for receipt inside the frame of a window and adjacent thereto to prevent unlawful entrance through the window, the panel comprising:

a removable panel frame having a first and second side member adjacent to the sides of the window frame and an upper and lower member adjacent the top and bottom of the window frame, the frame members attached to cross members, the cross members disposed in a spaced relationship to each other, the spacing small enough to prevent human entrance therethrough;

a "U" shaped channel adapted for attachment to the inside top of the window frame, the "U" shaped channel receiving the upper member of the panel frame therein when the panel frame is disposed inside the window frame; and

a "L" shaped lock pin having a vertical arm adapted for receipt through an aperture in the lower member of the panel frame and into an aperture in the window frame, the pin further having an upper horizontal arm with an aperture therethrough, the aperture indexed with an aperture in a lock keeper extending outwardly from the first side of the member, the aperture in the lock pin and the lock keeper when indexed adapted for receiving a standard lock or the like therethrough.

4,478,003

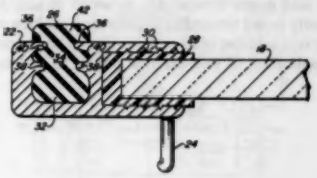
INTERIOR INSULATING WINDOW SYSTEM

Dennis E. Flett, 1301 E. Silver Lake, Tucson, Ariz. 84713

Filed Feb. 1, 1982, Ser. No. 344,635

Int. Cl.³ E05B *65/03*

U.S. Cl. 49—63 **2 Claims**



1. A storm window assembly comprising:

a U-shaped track for mounting on a window sill into which a window may be slidably positioned including a base, at least first and second sidewalls extending perpendicularly from said base to form at least one channel, and a layer of adhesive material coupled to the underside of said base for securing said track to said window sill; and

at least two individual overlapping windows which ride in said U-shaped track, each of said overlapping windows including:

a pane of glass,

a frame around said pane of glass including first and second vertical members, each of said vertical members having a notched channel into which said pane of glass is positioned, said first vertical member having weather-stripping means extending the vertical height of said first vertical member for operably engaging one of said track sidewalls, said second vertical member having weather-stripping means extending the vertical height of said second vertical member for operably engaging the weather-stripping means in a confronting vertical member of the overlapping window to create a seal between said overlapping windows when in the closed position, each of said weather-stripping means which engages the other of said weather-stripping means to create said seal being positioned on the side of its respective overlapping window that is closest to the other overlapping window, one of said first and second vertical members being equipped with handle means for opening and closing said window assembly, and

sleeve means positioned between said notched channel and said pane of glass for operably securing said pane, the notches in said notched channel securely positioning said sleeve means therein.

4,478,004

WINDOW LIFTER AND DOOR LOCKING DEVICE

Marcel Andrei-Alexandru, and Hans Prohaska, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,225

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3111633

Int. Cl.³ B65J *1/08*; E05F *15/00*

U.S. Cl. 49—72 **3 Claims**

1. A combination power window and power door locking device for use in an automotive vehicle door comprising, in combination:

a reversible electric motor;

means for mounting said motor internally of said door;

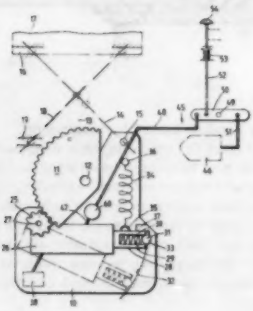
first means for coupling said motor to a movable window pane holder within said door to move said holder between first and second end positions;

second means for coupling said motor to a movable extension of a door locking mechanism within said door which is activated to lock and unlock said door;

means for selectively applying external power to said motor;

means cooperating with said first and second means and responsive to the position of said holder for engaging and activating said door locking mechanism when said holder is in one of its end positions;

wherein said motor is rotatably mounted in said door and resiliently urged toward an angular stop position until said holder is in said one of its end positions whereupon continued application of said external power to said motor rotates said motor away from said stop position to activate said door locking mechanism;



wherein said second means includes:

an input element connected to said motor, an output element connected to said extension of said door locking mechanism and a disengaging clutch connecting said input element to said output element; and,

wherein said door locking mechanism includes an actuating member connected to said output element for manually locking and unlocking said door when a predetermined force is applied to said actuating member; and

wherein said disengaging clutch disconnects said output element from said input element when the force transmitted through said disengaging exceeds said predetermined force.

4,478,005

REMOVABLE INTEGRALLY MOLDED CLOSURE

Glenn R. Mundschenk, Utica, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,062

Int. Cl.³ E05C *19/02*

U.S. Cl. 49—388 **4 Claims**

1. A closure for an opening in a cabinet, said closure comprising:

a substantially planar panel having front, rear, and first and second side edges for closely conforming to the configuration of the opening in the cabinet,

a pair of co-axial pintles extending outwardly from the respective ones of said side edges adjacent the rear edge thereof,

a pair of cutouts each disposed adjacent and parallel to a respective one of said side edges, each of said cutouts intersecting said rear edge and extending a substantial distance beyond said respective pintle toward said front edge such that said respective pintle projects from a resilient finger formed between said cutout and said respective side edge, whereby said pintles may be resiliently biased toward each other to permit placement of said enclosure in the opening in the cabinet and subsequently move resiliently outwardly to engage bores provided in the cabinet,

latch means integral with and disposed on said front edge, and

a cutout within said planar panel disposed adjacent and parallel to said front edge and extending a substantial distance beyond said latch means toward each of said side edges such that said latch means is provided on a relatively thin resilient strip extending along the front of said panel, whereby said latch means may be resiliently biased toward said rear edge to permit said front edge of said closure to enter the opening in the cabinet and subsequently move resiliently forward to lock said closure in the opening.

4,478,006

SLIDING DOOR FRAME CORNER LOCK

Leonard E. Johnson, Jr., Elkhart, Ind., assignor to L. E. Johnson, Inc., Elkhart, Ind.

Filed Aug. 11, 1983, Ser. No. 522,469

Int. Cl.³ E05D *13/02*

U.S. Cl. 49—410 **8 Claims**

1. In a sliding door assembly including a frame having adjoining frame members, a panel member peripherally enclosed by said frame members, means associated with said frame for mounting said door assembly within a door opening for sliding movement over said door opening, the improvement comprising a removable lock associated with said frame for securing two of said adjoining frame members together, said lock including engagement parts overlying and engaging said adjoining frame members at a frame corner to prevent lateral separation of the frame members from the panel member, said lock further including locking tabs and an associated pivotal actuator part shiftable between a lock position in which said locking tabs are extended and a release position in which the locking tabs are retracted, said actuator part being in its lock position with said locking tabs engaging said adjoining frame member

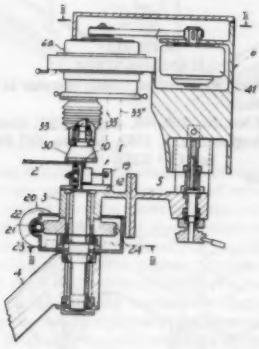
to prevent lifting separation of said engagement parts from the adjoining frame members.

4,478,007

TOOL POSITIONING DEVICE FOR MACHINING THE EDGES OF SHEET OR PLATE MATERIALS

Franco Bavelloni, Appiano Gentila, Italy, assignor to Z. Bavelloni S.P.A., Bregnano, Italy

Filed Apr. 5, 1982, Ser. No. 365,748
Claims priority, application Italy, Apr. 14, 1981, 21486/81[U]
Int. Cl.³ B24B 17/00
U.S. Cl. 51—100 R **3 Claims**



1. A device for angularly positioning a tool head for machining the edges of sheet or plate workpiece materials, wherein the machine comprises supporting means for rotatably supporting the tool head about a first axis in use extending transverse to the plane of the workpiece, driving means for controllably imparting angular movements to said tool head and wherein said device comprises a swivelling tracer member having its own axis of rotation in use extending transverse to the plane of said workpiece and about which said swivelling tracer member is adapted to swivel, said tracer member having two spaced apart tracer points movably engaging simultaneously in use the edge of the workpiece to be machined, said tracer points being arranged in fixed position on said tracer member thereby to cause in use angular displacement of said tracer member bodily therewith depending on the curvature profile of the edge of said workpiece against which said tracer points engage, the device further comprising an actuating member responsive to the angular displacement of said tracer member and control means for said driving means to controllably actuate said driving means for imparting controllable angular displacement to said tool head depending on the curvature profile against which said tracer points engage.

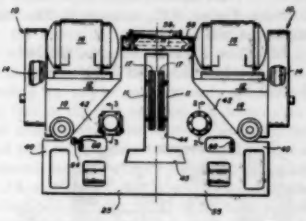
4,478,008

THERMALLY STABILIZED DOUBLE DISC GRINDING MACHINE

Elman R. Dunn, Roscoe, Ill., assignor to Litton Industrial Products, Inc., Waynesboro, Pa.

Filed Nov. 19, 1981, Ser. No. 322,883
Int. Cl.³ B24B 7/00; 55/00; 41/02; 41/04
U.S. Cl. 51—111 R **3 Claims**

1. A double disc grinding machine comprising
first and second stock removal assemblies, each including a wheelhead assembly including
base means for slidably supporting said wheelhead assembly,
frame means for supporting said first and second stock removal assemblies including
front and rear wall means, each having a vertically extending opening defined therein, a top portion above said opening and a bottom portion below said opening,
said top portion of said front wall means including a tensile bolster and said top portion of said rear wall means including a tensile bolster,
means including one of said tensile bolsters for defining a first liquid container,
means including said other one of said tensile bolsters for defining a second liquid container,



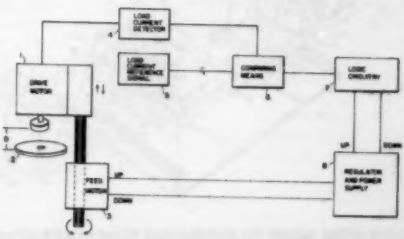
means including said bottom portions for defining a third liquid container,
each of said containers having inlet and outlet means,
conduit means for connecting the outlet port means of said third container to said inlet port means of said first and second containers and for connecting said outlet port means of said first and second containers and said inlet port means of said third container, said conduit means including a fluid recirculating pump.

4,478,009

AUTOMATIC CONTROL SYSTEM FOR MACHINE TOOLS

Daniel M. Rukavina, 3873 9th ST., and David H. Arnold, 1711 Gilmore, both of Winona, Minn. 55987

Filed May 9, 1978, Ser. No. 904,210
Int. Cl.³ H02P 7/68; B23Q 5/10; B24B 51/00
U.S. Cl. 51—165.8 **2 Claims**



1. In an automatic control system for a machine tool of the type having a rotary tool, an electrical drive motor therefor and a mechanical feed mechanism for incrementally varying the distance between such rotary tool and a workpiece, including an alternating current singlephase feed motor having an output shaft connected to such mechanical induction mechanism to drive same, means for comparing an electrical signal proportional to the load current in such electrical drive motor with a selectable reference signal, and means responsive to the output of said comparing means for controlling the application of an unconditioned alternating line current source to said feed motor, such that it turns, in a forward or reverse direction or stops, to control in an incremental manner the distance between such rotary tool and the workpiece so as to minimize the output of said comparing means, wherein said comparing means comprise a current sensor for sensing drive motor load

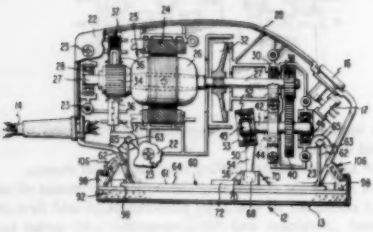
current, a conversion circuit for converting said sensed current into a voltage signal proportional thereto, a summing amplifier which sums said voltage signal with said selectable reference signal to determine whether or not said alternating current feed motor will be incrementally driven, and a comparator which determines the direction said feed motor will be incrementally driven.

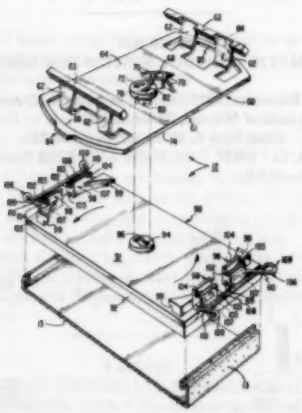
4,478,010

IN-LINE SANDER

William C. Dicke, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 25, 1983, Ser. No. 555,240
Int. Cl.³ B24B *23/04*
U.S. Cl. 51—170 TL **3 Claims**





1. An in-line sander for moving sand paper in a linear path, said sander being adapted to be held in the palm of a hand for urging a work surface, said sander comprising:

a housing;

a rotating electric motor supported by said housing, said motor having a output shaft parallel to a plane including said linear path;

a drive shaft rotatably supported by said housing substantially parallel to said linear path;

a gear transmission connecting said motor output shaft and said drive shaft for actuating said drive shaft;

a platen;

means on said platen for retaining a strip of sand paper affixed thereto;

means supported by said housing and constrained to move in a linear path for supporting said platen with said sand paper in a position urging against said work supporting surface, said supporting means including a platen support fashioned from a resilient material and including a base portion for attachment to said platen, a pair of legs extending from said base portion to a free end contiguous said housing for attachment thereto, said legs having a flexibility implemented by a low moment of inertia in the direction of said linear path, said legs further having a rigidity implemented by a high moment of inertia in a direction transverse to said linear path; and,

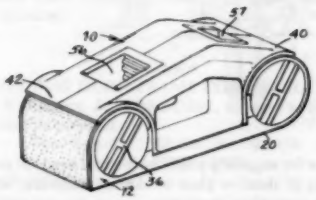
means carried by said drive shaft and connected with said supporting means for influencing motion of said support means in said linear path.

4,478,011

HAND SANDER

Richard H. Russell, Farmington, Conn., assignor to Norton Co., Worcester, Mass.

Continuation of Ser. No. 289,448, Aug. 3, 1981, abandoned. This application Dec. 1, 1983, Ser. No. 557,384
Int. Cl.³ B24B *17/00*
U.S. Cl. 51—360 **5 Claims**



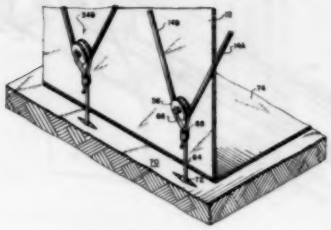
1. A sander including a pusher element and a supply means for holding a strip of coated abrasive, which abrasive strip has front and back sides, and from which a fresh length of the strip may be drawn from time to time and held on the sander to expose the front side thereof for abrading an object and the used portion of the strip may be stored, said sander comprising a cassette having a pair of storage chamber means forming respectively a supply chamber and a take-up chamber for receiving said coated abrasive strip, said supply chamber holding the strip before the strip has been used and said take-up chamber serving for storing the strip after it has been used for abrading said object, said cassette having a thin rigid bearing means including a working surface, said working surface having front and back sides and said working surface extending lengthwise between said supply chamber which is at one end of the bearing means and said take-up chamber which is at the other end thereof, said bearing means being formed integrally with said pair of storage chamber means, each of said storage chamber means having means defining an opening through which said fresh strip may be drawn from said supply chamber and laid over said working surface and through which said used portion may be moved respectively into said storage chamber means, means to hold the back side of said withdrawn strip in contact with the front side of said working surface, means integral with the back side of said working surface to removably attach said cassette to said pusher, said attaching means including a pair of sliding track means integral with said pusher, a pair of cooperating sliding track means integral with said bearing means on the back side of said working surface, and each of the respective cooperating tracks of said pairs of sliding track means being disposed in spaced apart relation along to the back side of the length of said working surface, with one of said pair of track means respectively being positioned next to each of said storage chamber means at the opposite ends of the bearing means.

4,478,012

CABLING SYSTEM FOR AN INFLATABLE BUILDING

Donato M. Fraioli, Mamaroneck, N.Y., assignor to Air Structures International, Inc., Tappan, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,105
Int. Cl.³ E04B 1/34
U.S. Cl. 52—2 10 Claims



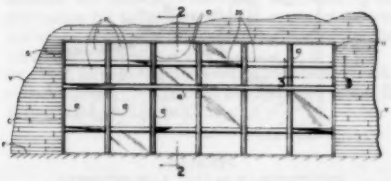
1. A cabling system for reinforcement of an inflatable building structure comprising a latticework of crisscrossed cables arranged to extend over the entire building with substantially all of the cables which meet a lower peripheral edge of the structure being arranged diagonally at a uniform angle of substantially less than ninety degrees to that edge and with substantially all of said cables which meet a lower peripheral edge being paired with the meeting an opposite diagonally extending cable at said peripheral edge, the members of each of said pairs of diagonally opposite extending cables being formed from one continuous cable extending down on one diagonal to the edge and turning back up on the other diagonal, anchoring means to hold said continuous cable at the turn between diagonals, said anchoring means comprising a sheave arranged to permit an adjustment in length between the associated diagonal cables wherein one diagonal cable becomes longer and the other diagonal cable becomes shorter.

4,478,013

SLOPED GLAZING STRUCTURE

John B. Tavano, 28 Edgewood Dr., Torrington, Conn. 06790

Filed Jul. 9, 1982, Ser. No. 396,620
Int. Cl.³ E04B 7/02
U.S. Cl. 52—92 7 Claims



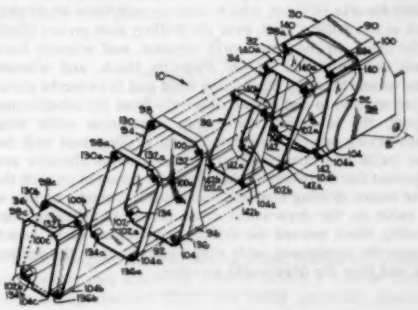
1. A sloped glazing structure adapted to support glazed panels and comprising an elongated horizontally extending sill defining a dpending channel in its lower surface to receive a wall structure, said sill including a generally flat horizontally extending upper surface, said sill including an edge portion projecting beyond said depending channel to form at least a part of external gutter means for the sloped structure, rafters perpendicular said sill and sloping upwardly from said sill upper surface at an angle of at least 30 degrees thereto, each said rafter having a generally inverted T-shaped cross sectional shape such that laterally projecting lower portions of said T-shaped rafter define channels on either side of a vertically extending stem portion of said T-shape, each rafter channel defining portion having a support surface, each rafter stem portion further including an integral cap portion defined by laterally projecting flanges along the upper edge of said stem portion, L-shaped glazing stops secured to said rafter stem portions below said cap portions thereof to abut inclined lower edge portions of the glazed panel, horizontally extending purlin means between said rafters, said purlin means comprising a lower division bar having lower opposed flanged portions and defining a flat lower surface, said lower division bar flanged portions having end portions received on adjacent support surfaces of said channel defining rafters, each lower division bar further including at least one upwardly projecting flange, said purlin means further comprising an upper division bar secured to the lower bar and having flanged portions which cooperate with said flanged portions of said lower division bar to receive the glazed panel therebetween, at least one horizontally extending top rail having vertically spaced lands to abut an existing wall or the like, said top rail defining an elongated opening of channel shape to receive the upper ends of said rafters, and stop ridge means between said rafters and in said top rail channel, said stop ridge means comprising a lower stop ridge bar of L-shape with one flange facing upwardly, said one flange having end portions received on adjacent glazing support surfaces of said channel defining rafters, said L-shaped lower stop ridge bar having another flange secured to said top rail at the inner boundry of said channel shaped opening thereof.

4,478,014

TELESCOPIC BOOM WITH ANGLED CORNER CONSTRUCTION

Darwin N. Poock, Cedar Rapids, and Thomas J. Volkmann, Hiawatha, both of Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 14, 1981, Ser. No. 330,060
Int. Cl.³ E04H 12/34
U.S. Cl. 52—115 13 Claims



1. An apparatus for maintaining telescopic boom sections having inner and outer ends in alignment relative to a vertical plane when loaded and subjected to a side force comprising: means in a large cross-sectioned boom section defining upper angle corner plates having parallel inner and outer planar surfaces converging upwardly and inwardly at the same angle relative to a central vertical plane containing the longitudinal axis of said large boom section, means in said large cross-sectioned boom section defining lower angle corner plates having parallel inner and outer planar surfaces converging inwardly and downwardly at the same angle relative to said central plane, first bearing means secured to the inner end of a smaller cross-sectioned boom section in position to movably engage only said inner planar surfaces of said upper angle corner plates of said large cross-sectioned boom section, means in said smaller boom section defining lower angled corner plates having parallel inner and outer planar surfaces converging inwardly and downwardly at the same angle relative to said plane, and second bearing means secured to the inner surface

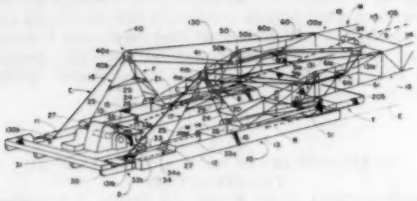
of said lower corner plates of said large boom section near its outer end in position to movably engage only said outer planar surfaces of said lower angle corner plates of said smaller boom section.

4,478,015

CABLE SLING ARRANGEMENT FOR PIVOTING A DRILLING MAST AND DRAWWORKS ELEVATOR TO A RAISED OR RECLINED POSITION IN RELATION TO A SUBSTRUCTURE SUPPORT AND METHOD OF CABLE SLING STRING UP

Larry K. Lawrence, 11219 Champion Woods Dr., Houston, Tex. 77375, and John J. Grisaffi, 8005 Longridge, Houston, Tex. 77055

Filed Sep. 7, 1982, Ser. No. 414,968
Int. Cl.³ E04H *12/34*
U.S. Cl. 52—120 **15 Claims**



1. In a cable stringing arrangement for securing to a drilling mast and drawworks elevator for pivoting the drilling mast and drawworks elevator from a reclined position to an erect position in relation to a substructure support on which they are pivotally secured by reeling in a cable on a rotatable drum on the drawworks elevator, which cable extends from a traveling block in the drilling mast, over the drilling mast crown block, to the drum on the drawworks elevator, and wherein hook means are suspended by the traveling block, and wherein frame means between the drilling mast and drawworks elevator are secured to and extend upwardly from the substructure support, the invention comprising continuous cable sling means having one end connected to the drilling mast with the other cable end connected to the drawworks elevator and supported therebetween by sheave means mounted on each the frame means, drilling mast and hook means whereby reeling in the cable on the drawworks drum moves the drilling mast traveling block toward the drilling mast crown block which actuates the continuous cable sling means to erect the drilling mast and then the drawworks elevator.

4,478,016

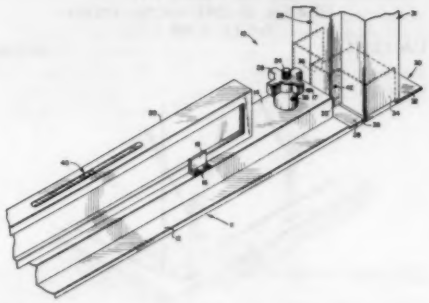
DOOR JAMB LEVELER

Ernest R. Allen, 1131 Vine St., Jonesboro, Ark. 72401

Filed Sep. 15, 1982, Ser. No. 418,429
Int. Cl.³ E04D *14/00*
U.S. Cl. 52—126.1 **4 Claims**

1. A device for leveling a door jamb, comprising:

a planar central spacer member having a threaded aperture at each end and a lip portion of relatively thin vertical dimension located at each outer end of said spacer member; a bolt member threadedly received in each of said apertures, each bolt having knob means at the upper end for use in rotating said bolt; means attached to said spacer member for indicating the level condition of said spacer member; and a pair of anchor base plates located adjacent to and aligned with the lip portion of the respective ends of said spacer member, each base plate having a planar base member and a vertical member extending upwardly therefrom, said vertical member having a shape which conforms to the interior configuration of a side portion of the door jamb, and wherein said vertical member of each base plate has a central portion which extends over the lip portion on the respective end of said spacer member, the



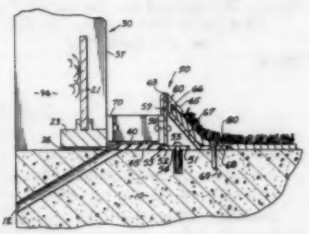
lower edge of said central portion being raised above the respective lip portion.

4,478,017

FLOORING PROTECTION SYSTEM

William R. Brown, 2521 E. 35th, Spokane, Wash. 99203, and Baxter Brown, Box 1313, Coeur d'Alene, Id. 83814

Filed Mar. 28, 1983, Ser. No. 479,721
Int. Cl.³ E06B *7/14*
U.S. Cl. 52—209 **11 Claims**



1. A flooring protection system for sealing along the surface of a floor near a window, door or other source of liquid, and for supporting floor covering in an attractive and protected position removed from the liquid, comprising:

a barrier piece positioned along the floor and including means to form a liquid-tight seal therewith; said barrier piece having an upstanding flange to act as a dam to any liquid collected nearby; and

a cover piece supported by said barrier piece; and cover piece having an inclined ramp extending downwardly to the floor opposite from the source of liquid for stabilizing the upstanding flange of the barrier piece and supporting superjacent floor covering;

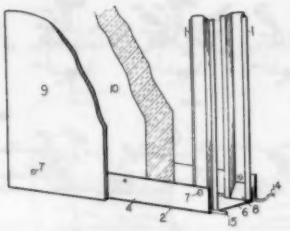
whereby liquid is contained on one side of the flooring protection system to protect the floor and floor covering from the destructive action of the liquid.

4,478,018

THERMAL BREAK EXTERIOR INSULATED WALL FRAMING SYSTEM

John F. Holand, 1704 Danby Rd., Ithaca, N.Y. 14850

Filed Jul. 28, 1981, Ser. No. 287,590
Int. Cl.³ E04B 2/00
U.S. Cl. 52—220 **4 Claims**



1. A thermal break insulated wall comprising:

a. insulating means for creating a thermal-break, comprising top, bottom, and a plurality of side edges, and two planar surfaces separated by a thickness of insulating material, said thickness determining the insulation value of the wall;

b. two horizontal channel elements, defining the top and bottom of the wall, each channel element having a substantially "U" shaped cross-section with a horizontal surface and two vertical side surfaces meeting at right angles, the horizontal surface of each channel being of suitable dimensions to encompass the thickness of the insulating means between the vertical surfaces;

c. a plurality of metal stud means linearly disposed along the channel elements, each comprising two vertical half-studs placed on opposite sides of the insulating means, the insulating means forming a thermal-break between the vertical half-studs;

d. means for fastening the vertical half-studs of the stud means to the vertical side surfaces of the channel elements, comprising rivet means engagably inserted through holes in the ends of the vertical half-studs and the vertical side surfaces of the channel elements;

e. surfacing means for covering the wall comprising sheet means for creating a solid surface disposed parallel to the planar surfaces of the insulating means, creating air gaps between the surfacing means and the insulating means; and means for fastening the sheet means to the vertical half-studs, and to the vertical side surfaces of the channel elements;

f. tie means for fastening the vertical half-studs of each stud means together, compressing the insulating means firmly between the vertical half-studs.

4,478,019

STRUCTURAL FOAM PARTITIONS

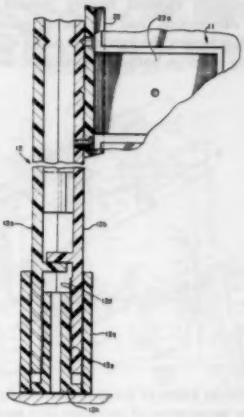
William A. Thompson, Jr., Toms River, N.J., assignor to General Partitions Mfg. Corp., Erie, Pa.

Filed Oct. 15, 1981, Ser. No. 311,633
Int. Cl.³ E04B 2/00
U.S. Cl. 52—239 **4 Claims**

1. An enclosure formed of structural foam panels, molded pilasters having tenons and a floor mount comprising

a pair of identical symmetrically molded panel halves each formed from the same mold, each panel half having a first and second section divided by an axis of symmetry, each panel formed by rotating one of said panel halves 180° about its axis of symmetry,

molded-in first and second mortise halves for said first and second sections respectively, each first mortise half being equally spaced from said axis of symmetry as each second mortise half, said first and second mortise halves being adapted to mate with each other to form a full mortise to receive a tenon of said pilaster; and



each pilaster having serrations, and said floor mount having corresponding serrations whereby the serrations on said pilaster meet with the floor mount serrations.

4,478,020

WINDOW REVEAL MOLDING

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Dec. 15, 1981, Ser. No. 330,846
Int. Cl.³ E04C 2/38, 5/07
U.S. Cl. 52—309.13 **19 Claims**

1. An elongated molding having a head portion and a mounting portion, said mounting portion having a hollow interior enclosed by resilient walls and being generally diamond-shaped in cross-section, each of said resilient walls comprising a pair of side walls connected to said head portion and diverging outwardly therefrom and a biasing wall with each opposite lateral edge connected to a divergent lateral edge of one of said side walls, one of said pair of side walls having a greater height than the other of said pair.

4,478,021

CONSTRUCTION MATERIAL, A MODULAR, PRE-INSULATED AND FURRED STRUCTURAL MASONRY BUILDING BLOCK

Gary J. Person, 105 Arlene Dr., North Versailles, Pa. 15137

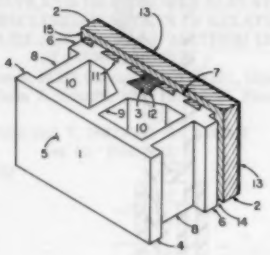
Filed Sep. 30, 1982, Ser. No. 428,958
Int. Cl.³ E04B 2/00
U.S. Cl. 52—375 **5 Claims**

1. A basic unit for use in a modular building sytem, said unit comprising:

(a) a masonry element having facing panels joined back to back by perpendicularly extending reinforcing panels, said facing and reinforcing panels forming a square box config-

uration enclosing void spaces which are open at either end;

(b) an insulation element attached to at least one face panel, said insulation element having greater horizontal and vertical dimensions than the facing panel to which it is attached, whereby the insulation panel will extend beyond the facing panel in both the horizontal and vertical directions to cover joints of the modular building system and to block the movement of moisture into said joints;



(c) a vapor barrier on one surface of the insulation element, and

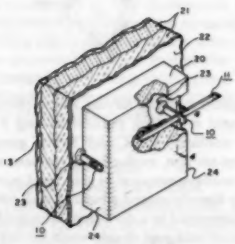
(d) a furring element entrapped between the facing panel and the insulation element, said furring providing a series of attachment zones on at least one face of the modular building system.

4,478,022

INSULATION SYSTEM AND METHOD AND APPARATUS FOR RETAINING SAME

Harold C. Wilkinson, Medford; Charles C. Pease, Vincentown, and Kevin Wall, Medford Lakes, all of N.J., assignors to KSM Fastening Systems Inc., Moorestown, N.J.

Filed May 18, 1982, Ser. No. 379,312
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—509 **6 Claims**



1. An insulation system for insulating metallic walled structures such as furnaces, kilns and the like comprising:

a plurality of elongate end weldable metallic studs welded to the metallic wall of the structure in a predetermined array and upstanding from the metallic wall;

at least one insulation blanket impaled over the studs and against the metallic wall;

a plurality of modular insulation blocks having side walls adapted to be positioned in contact with one another between adjacent studs;

an elongate relatively thin block retaining pin;

interlocking means permitting the block retaining pin to pierce the side walls of adjacent insulation blocks while interlocking with the stud; and

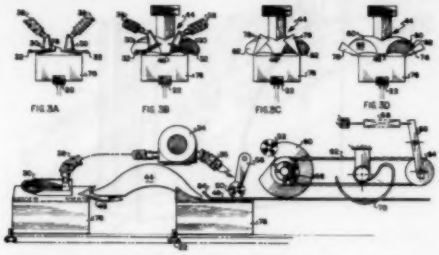
wherein the interlocking means includes an aperture in the stud and a cooperating deformation in the pin.

4,478,023

UNIVERSAL FOUR FLAP OPENER

Michael L. Becker, Akron, Ohio, assignor to Figgie International, Inc., Willoughby, Ohio

Filed Apr. 29, 1982, Ser. No. 373,238
Int. Cl.³ B65B *43/49*
U.S. Cl. 53—382 **16 Claims**



1. A flap opener, comprising:

an input conveyor;

a pair of vacuum-actuated side flap openers positioned along said conveyor;

a side flap spreader positioned along said conveyor after said vacuum-actuated side flap openers;

a pair of brushes in common driven interconnection, rotatably maintained above said conveyor beyond said spreader, said brushes adapted for opening engagement with front and rear flaps of a container; and

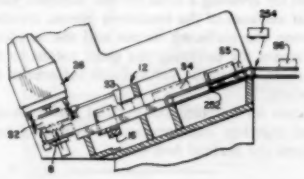
wherein said brushes rotate about parallel axes, in opposite directions, said brushes being driven by a common shaft in adjustable spaced relationship with respect to each other, at least one of said brushes being connected to an adjustable hub on said shaft via a crank arm.

4,478,024

STACK HANDLING METHOD AND APPARATUS

Andrew H. Vedvik, Poynette, and Myron J. Merdler, Monona, both of Wis., assignors to Oscar Mayer Foods Corp., Madison, Wis.

Filed Sep. 28, 1981, Ser. No. 306,461
Int. Cl.³ B65B *5/06, 39/02, 39/12*
U.S. Cl. 53—473 **22 Claims**



1. A method for transferring stacks of sliced food products from a loading station to a cavity in a container, the method employing an apparatus having a gripper assembly with at least a pair of pick-up fingers for receiving a stack between the fingers and a guide finger of a length greater than the pick-up fingers, the method comprising:

moving the gripper assembly to adjacent the load station;

spreading the pick-up fingers and guide finger sufficiently to receive a stack by the fingers;

positioning a stack between the pick-up fingers;

closing the pick-up fingers and guide finger to retain the stack;

moving the gripper assembly to a position above the cavity;

lowering the gripper assembly adjacent the container until the guide finger extends at least partially into the container;

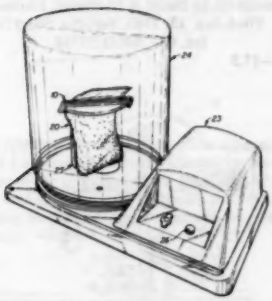
spreading the pick-up fingers, while precluding spreading of the guide finger, to release the stack into the cavity.

4,478,025

VACUUM PACKING DEVICE

Gregory P. Scanlan, 821 Pine St., San Francisco, Calif. 94108

Filed Aug. 31, 1981, Ser. No. 297,860
Int. Cl.³ B65B 31/00
U.S. Cl. 53—512 1 Claim



1. A system for vacuum packing perishable materials in open-ended bags constructed of gas-impermeable material, comprising

a chamber of gas-impervious material, said chamber having an access opening of substantial dimension;

an open-ended bag of gas-impermeable material within said chamber, said bag being at least partially filled with a perishable material;

opposable clamp means adjacent to an open filling end of said bag and positioned exteriorly adjacent to said end of the bag on opposite sides thereof, said clamp means being positioned to hold said gas-impermeable material of said bags substantially flat in the area adjacent to said filling end; said clamp means being in the form of a plurality of flat, elongated prongs permanently adjoined at one end by hinge means, whereby at the unhinged end of a first prong a locking means is attached adapted to securely interlock with the unhinged end of a second prong, thereby holding said clamp means in a closed position;

an enclosure for said access opening of said chamber constructed of gas-impermeable material;

sealing means between said enclosure and said chamber;

means to evacuate the interior of said chamber, whereby gases may be withdrawn from the interior of said chamber and from within the interior of said bag and from within the interstices of said perishable materials;

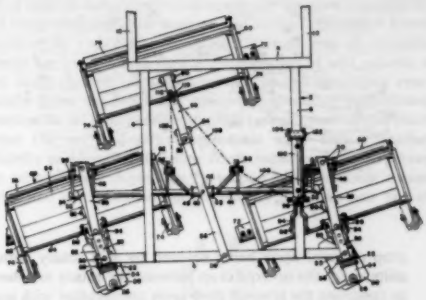
means to break the vacuum within said chamber by rapidly introducing atmospheric air pressure into said chamber to thereby bring said opposable clamp means together to retain the vacuum within said bag, said clamp means being provided with deformable strip material upon opposable surfaces thereof, said deformable strip material serving to facilitate movement of gases from within said bag at such a time as the chamber is being evacuated but operable to quickly compress the gas impermeable material of said bag adjacent said filling end of the bag to retain said vacuum within said bag when said chamber is opened to atmospheric air pressure.

4,478,026

GANG REEL MOWER

David L. Mullet, Hesston; Raymond J. Rilling, Moundridge, and Elmer D. Voth, Newton, all of Kans., assignors to Ekoeg Industries, Inc., Kans.

Filed Jun. 3, 1983, Ser. No. 500,880
Int. Cl.³ A01D 35/24
U.S. Cl. 56—7 6 Claims



1. A gang reel mower comprising:

a. a generally horizontal frame having means for supporting it for movement over the ground in spaced relation thereabove,

b. a plurality of reel-type mower heads disposed in horizontally spaced apart relation beneath said frame, so as to be supported on the ground and to cut grass when moved forwardly thereover,

c. castering means connecting each of said mower heads to said frame for pivotal motion about a vertical axis disposed forwardly of said head, whereby each head moves accurately forwardly even when the mower is negotiating a turn,

d. means operable to drive said mower heads, and

e. power means operable when actuated to elevate said mower heads relative to said frame to a transport position out of contact with and well above ground level, said power means including means whereby it is rendered additionally operable, as it elevates each of said mower heads, to move said mower head to a central portion of its castering motion, and to substantially lock it against further castering motion.

4,478,027

MOWER-CONDITIONER

Frans J. G. C. De Coene, and Adrianus Naaktgeboren, both of Zedelgem, Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed May 3, 1982, Ser. No. 374,590
Claims priority, application United Kingdom, May 8, 1981, 8114061
Int. Cl.³ A01D 55/18, 57/30, 82/00
U.S. Cl. 56—16.4 25 Claims

1. A mower-conditioner comprising:

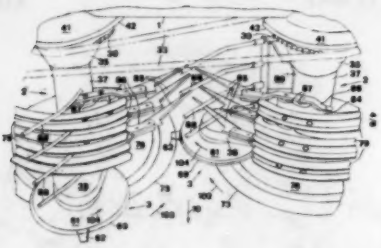
a frame;

a pair of rotary members on said frame for rotation about generally vertical axes at a first rotational speed, each said rotary member having at least one rotary cutter unit associated therewith, each said rotary cutter unit being rotatable at a second rotational speed to sever standing crop material;

first and second sets of stationary tines mounted on said frame and corresponding, respectively, to said rotary members, said sets of stationary tines being angularly disposed with respect to each other between said rotary members; and

first and second sets of rotating tines mounted, respectively,

for rotation with said rotary members, each set of rotating tines being arranged to cooperate with both said first and second sets of stationary tines when passing between said rotary members to condition severed crop material therebetween, said rotating tines also being operable to engage



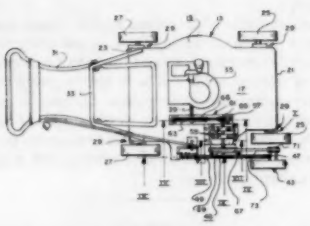
crop material upon being severed by said rotary cutter units, carry the severed crop between the rotary members to condition the severed crop upon cooperation with said stationary tines and disengage the severed and conditioned crop material rearwardly of said rotary members.

4,478,028

DEMOUNTABLE LAWN EDGER/MOWER COMBINATION

Gerthen L. Dawson, Jr., 3984 Callahan Dr., Memphis, Tenn. 38127

Filed Feb. 2, 1984, Ser. No. 576,367
Int. Cl.³ A01G *3/06*
U.S. Cl. 56—16.9 **14 Claims**



1. Apparatus for edging and mowing lawns, said apparatus comprising:

(a) a rotary lawn mower including a housing having a generally horizontal platform member, a motor mounted on said platform member and having a first drive shaft and a second drive shaft, and a generally horizontal mower blade rotatably coupled to said first drive shaft and located beneath said platform member;

(b) a rotary lawn edger including an elongated body member having first and second ends, an edger shaft member rotatably attached to said first end of said body member of said edger, and a generally vertical edger blade member rotatably coupled to said edger shaft and located beside said housing of said mower;

(c) attachment means for demountably attaching said second end of said body member of said edger to said housing of said mower;

(d) an intermediate shaft rotatably supported on said housing of said mower;

(e) a first speed increaser drive means for causing said intermediate shaft to rotate at a speed faster than said second drive shaft of said motor of said mower, said first speed increases drive means including positive drive means for positively coupling said intermediate shaft and said second drive shaft of said motor of said mower; and

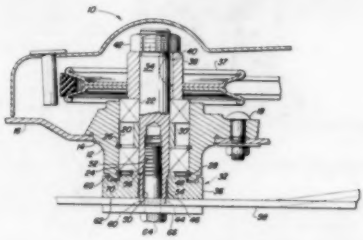
(f) a second speed increaser drive means for causing said edger shaft to rotate at a speed faster than said intermediate shaft, said second speed increaser drive means including slippable drive means for slippingly coupling said edger shaft and said intermediate shaft.

4,478,029

MOWER BLADE SPINDLE ASSEMBLY

James W. Moore, Beaver Dam, and Lee J. Wanie, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jun. 13, 1983, Ser. No. 503,973
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—17.5 **3 Claims**



1. In a rotary mower drive assembly including a vertical shaft journalled for rotation in a bearing housing with a drive pulley being mounted on the shaft above the housing and a hub being fixed to the shaft below the housing, and a mower blade being held in tight frictional engagement with a bottom surface of the hub by a blade mounting bold extending through the blade and threadedly received in a threaded bore section extending axially into a lower end of the shaft, an improved spindle assembly comprised of the shaft and hub, comprising: said shaft having a threaded exterior located adjacent said lower end; said hub having a threaded central bore received on said threaded exterior of the shaft; said shaft including a tapered thread relief section commencing at an upper end of the threaded exterior thereof; said central bore of said hub including a tapered end portion received on and shaped complementary to the thread relief section; a bore extending axially into the lower end of the shaft and said threaded bore section forming a sole threaded portion of the last-mentioned bore and being located in the shaft entirely above the threaded exterior of the shaft and within the bearing housing.

4,478,030

MACHINE FOR CUTTING FORAGE PLANTS

Robert E. J. Druais, La Roche/S/Yon, and Damien M. M. Barbeau, Coex, both of France, assignors to Hesston Corporation, Hesston, Kans.

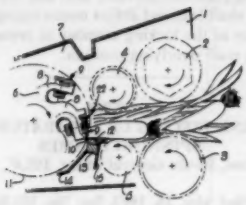
Filed Sep. 14, 1981, Ser. No. 301,723
Claims priority, application France, Oct. 20, 1980, 80 22398
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—60 **4 Claims**

1. In a forage harvester having a rotary crop cutter and apparatus for feeding crop materials into the cutter at a predetermined rate of speed relative to the rotational speed of the cutter whereby to sever the materials into small fragments of predictable length, the improvement comprising:

a plurality of circumferentially spaced knives having outermost cutting edges that describe a cylindrical extremity of the cutter during rotation thereof; and

a plurality of fragmenting bars, one bar for each of said knives, interspersed between said cutting edges of the knives and each having a generally radially outwardly projecting, crop-engaging portion terminating in an outer-

most serrated margin located inwardly adjacent said cylindrical extremity and presenting a series of rasping teeth, each of said margins having blunt, leading crop-impacting surfaces for fracturing crop materials by impact blows as the materials are projected into the cutter by said feeding apparatus,



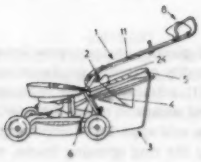
said feeding apparatus including structure separate from said cutter and fragmenting bars and spaced forwardly of said crop cutter in the direction of travel of said harvester, for engaging and gripping said materials during cutting and fragmenting thereof by said cutter and fragmenting bars respectively.

4,478,031

LAWNMOWERS WITH ROTATABLE CUTTING BLADES

Elmar Wolf, Wissembourg, France, assignor to Outils Wolf, Sarl, Wissembourg, France

Filed Aug. 4, 1982, Ser. No. 404,972
Claims priority, application France, Aug. 5, 1981, 81 15489
Int. Cl.³ A01D *53/06*
U.S. Cl. 56—202 **1 Claim**



1. In a lawnmower with rotating cutting blades, a central handle, a collection receptacle, a hook on the central handle, a metal bail on the collection receptacle that engages the hook, and a pivotal grass deflector; the improvement in which the central handle has a base in the form of a yoke comprised by two spaced cylindrical coaxial portions, the deflector being pivotally mounted on said portions, the upper end of the handle being of triangular shape and having a raised cross piece and lateral risers connected to one end of a central sleeve on which is fixed said hook and whose other end is connected to said base, said lateral risers being inclined toward each other in the direction of said crosspiece, the deflector being of blow molded high density polyethylene having on its lower surface a downwardly interrupted profile adapted to deflect cut grass toward the ground when said receptacle is not used.

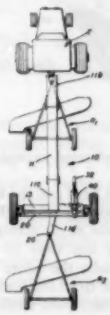
4,478,032

DUAL IMPLEMENT HITCH

William B. Inskeep, Rte. 4, Box 15, Culpeper, Va. 22701

Filed Jan. 31, 1983, Ser. No. 462,674
Int. Cl.³ A01D *7/00, 78/04;* B60D *1/14*
U.S. Cl. 56—377 **17 Claims**

1. A dual implement hitch for side delivery hay rakes and other implements, whereby two implements, each having its own wheel supported frame may be towed by a single vehicle and selectively positioned by operation of a control means to track one behind the other in tandem, to track one behind and offset laterally to the left of the other, and to track one behind and offset laterally to the right of the other, comprising an arched longitudinal main frame member having front and rear ends, front hitch means on the front end of said arched longitudinal main frame member for pivotally supporting the front end of said longitudinal member entirely on said vehicle, an arched transverse frame member rigidly connected to and supporting the rear end of said longitudinal main frame member, a pair of dirigible ground engaging wheels connected to and supporting opposite ends of said arched transverse frame member, tie rod means connected to said pair of dirigible wheels for maintaining parallel relationship of said wheels, a first hitch element means connected to and extending rearwardly from the front end of said longitudinal main frame member for pivotally connecting a first implement to said hitch under the arch of said longitudinal main frame member whereby said longitudinal main frame member may swing over top of said first implement, a second hitch element means connected to and extending rearwardly from the rear end of



said longitudinal main frame member for pivotally connecting a second implement to said hitch, and wheel offset control means for selectively positioning said wheels to one of: a position parallel with said longitudinal main frame member causing said second implement to track in tandem with said first implement, a left offset position wherein the second implement tracks to the left of the first implement and a right offset position wherein the second implement tracks to the right of the first implement, said arched transverse frame member comprising a transverse top central member having opposite ends, and a pair of depending legs rigidly joined to and depending from the opposite ends of said transverse top central member, said legs having lower extremities remote from said transverse top central member, and each of the depending legs of said pair of legs having means for dirigibly connecting one of said dirigible ground engaging wheels thereto adjacent the lower extremity thereof, said transverse top central member being elevated by said legs and by said ground engaging wheels above the ground by a height sufficient for passage of a windrow of hay thereunder without interference, and said tie rod means being elevated at least as high as said transverse top central member.

4,478,033

GARDENING TOOL

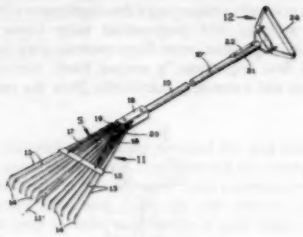
Dale R. Konyn, and Wayne T. Zielke, both of 2929 Blue Jay Turn, Delray Beach, Fla. 33444

Filed Dec. 30, 1983, Ser. No. 567,412
Int. Cl.³ A01D *7/00*
U.S. Cl. 56—400.06 **7 Claims**

1. A gardening tool comprising:
an elongated straight handle having a longitudinal axis;
a rake head attached to one end of said handle, said rake head having a plurality of elongated tines extending longitudinally beyond said one end of the handle at a first

obtuse angle to said longitudinal axis of the handle, said tines terminating away from the handle in transverse teeth which are located completely on one side of the handle, said rake head being substantially symmetrical on opposite sides of a longitudinal axis extending at said first obtuse angle to the longitudinal axis of the handle;

and a hoe head operatively connected to the opposite end of said handle and extending longitudinally beyond said opposite end of the handle at a second obtuse angle to said longitudinal axis of the handle, said hoe head being substantially symmetrical about a longitudinal axis extending at said second obtuse angle to the longitudinal axis of the handle, said hoe head away from the handle presenting a blade extending laterally on opposite sides of its longitudinal axis and positioned completely on one side of the handle;



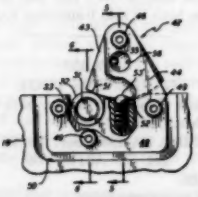
said axes of the rake head and the hoe head being offset from each other rotationally about the longitudinal axis of the handle by an acute angle substantially greater than zero and substantially less than 90 degrees whereby (a) to position substantially the entire hoe head on the opposite side of the handle from the body of a person holding the handle with the rake head teeth in raking position on the ground at one side of the person, and (b) to position the rake head teeth on the opposite side of the handle from the body of a person holding the handle with the hoe head blade in hoeing position on the ground at said one side of the person.

4,478,034

LOCK MECHANISM FOR WIRE STRANDING MACHINE

Dean L. Williams, Rome, N.Y., assignor to M.G.S. Mfg. Inc., Rome, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,188
Int. Cl.³ D07B 7/06
U.S. Cl. 57—58.34 **6 Claims**



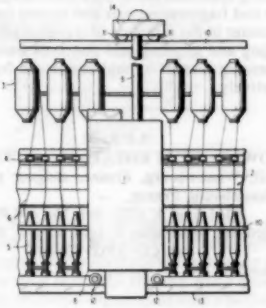
1. In a wire stranding machine including a rotatable tube, a cradle non-rotatably mounted within the tube, and a spool having a support shaft rotatably mounted in the cradle, the cradle being in the form of an open rectangular frame having spaced side rails, the side rails having opposed grooves for receiving the ends of the spool shaft; the improvement comprising a lock mechanism for releasable securing the ends of the spool shaft in the cradle side rail grooves, the lock mechanism having for each end of the spool shaft a generally sector shaped locking member movable into and out of a position overlying the shaft end, and detent means engageable with the arcuate surface of the locking member to releasably hold the member in its shaft overlying position.

4,478,035

BROKEN END PIECING UP APPARATUS FOR RING SPINNING FRAMES

Roberto E. Pons, Ronda General Mitre, 105,4°, 1ª, Barcelona (6), Spain

Filed Mar. 16, 1982, Ser. No. 358,803
Claims priority, application Spain, Mar. 21, 1981, 500590
Int. Cl.³ D01H 15/00
U.S. Cl. 57—262 **7 Claims**



1. A broken end piecing-up apparatus for a ring spinning frame having a plurality of roving packages and a plurality of spindles for yarn with a drafting system between said packages and said spindles and means to rotate the spindles to wind the yarn on the spindles, said apparatus comprising means to move the apparatus along the ring spinning frame, means to detect the absence of yarn between said drafting system and a said spindle, means for stopping and positioning the apparatus in registry with said spindle, an endless belt, spaced pulleys about which said belt is trained, a member carried by the apparatus and on which the pulleys are mounted for rotation, means to move the member toward and away from said spindle thereby selectively to bring said belt into and out of contact with said spindle between said pulleys, means to circulate said endless belt in contact with said spindle between said pulleys first to stop and then to reverse the direction of rotation of the spindle to an unwinding direction, means for grasping the broken end of yarn from the spindle, and means for uniting said broken end with an end of yarn from said drafting system.

4,478,036

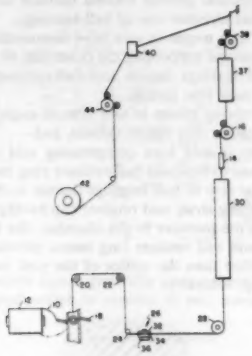
METHOD, APPARATUS AND INTERMITTENTLY TEXTURED YARN

Edgar H. Pittman, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 22, 1983, Ser. No. 468,469
Int. Cl.³ D02G 1/02, 3/34
U.S. Cl. 57—283 **12 Claims**

1. Method to produce a false twisted, continuous multifilament synthetic yarn comprising the steps of: supplying a continuous multifilament yarn from a supply package through a heater to a false twisting device, intermittently and randomly varying the supply of yarn to the false twisting device, driving

the false twist device at a speed to produce a twist multiple between 250 and 450 in the multifilament yarn, allowing the



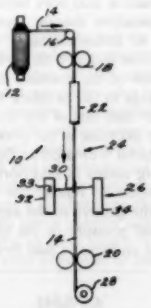
yarn to be set after false twisting and taking up the false twisted yarn.

4,478,037

TWISTING METHOD AND APPARATUS

Stanley Backer, 5 Irving Rd., Waban, Mass. 02168

Filed Jul. 16, 1982, Ser. No. 399,127
Int. Cl.³ D02G 1/04; D01H 7/92
U.S. Cl. 57—284 **24 Claims**



1. In a method of producing a stretch yarn of thermo-plastic polymer filaments where the yarn is moved along a path from a supply, through a heating zone, a cooling zone and a false twisting zone, the improvement comprising:

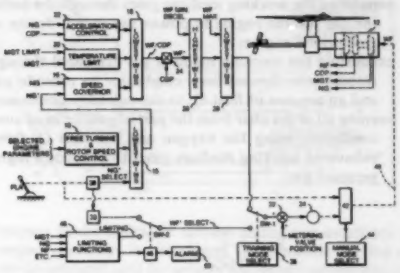
applying twist to the moving yarn in the false twisting zone by wrapping the yarn about pin means having a longitudinal axis and which intersects the yarn path at an angle greater than 90° and less than 100° as measured between the longitudinal axis of the pin on the side of the pin adjacent to the area where the yarn leaves the pin means and the path of the yarn downstream of the pin means.

4,478,038

ELECTRONIC FUEL CONTROL WITH MANUAL TRAINING MODE

George D. Cropper, Newington, and Anthony J. Gentile, Waterbury, both of Conn., assignors to Chandler Evans, Inc., West Hartford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,139
Int. Cl.³ F02C 9/28
U.S. Cl. 60—39.02 **5 Claims**



1. A method of controlling the rate of delivery of fuel to a gas turbine engine, the engine having a fuel control which includes a metering valve having a flow control member therein, the fuel control further having a metering valve flow control member actuator, said method comprising the steps of:

generating a command signal commensurate with a fuel flow delivery rate which corresponds to a manually selected engine operating condition;

generating a metering valve actuator control signal as a function of said command signal and a plurality of monitored engine operating parameters in a normal control mode and automatically positioning the metering valve flow control member via its actuator in accordance with said control signal;

selectively positioning the metering valve flow control member as a direct function of the manually selected engine operating condition in a manual backup mode of operation;

substituting said command signal for said generated actuator control signal to automatically position the metering valve flow control member as a function of the manually selected engine operating condition in a training mode of operation; and

limiting said command signal to a value which will maintain the fuel flow rate at a level which will not exceed the safe operating limit of monitored engine operating parameters in the training mode of operation.

4,478,039

UTILIZATION OF COAL IN A COMBINED CYCLE POWERPLANT

John J. Horgan, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 220,543, Dec. 29, 1980, abandoned. This application Jun. 6, 1983, Ser. No. 501,591
Int. Cl.³ F02C 3/28
U.S. Cl. 60—39.02 **3 Claims**

1. A method for producing power from coal in a combined cycle powerplant using a gas turbine engine formed of a compressor, a combustion chamber, and a turbine connected to a power output device, using a steam turbine engine including a boiler and a steam turbine connected to a power output device and using an auxiliary combustor, comprising the steps of:

feeding coal having a total heating value Q_t into a partial gasifier;

converting the coal into combustible fluids and combustible

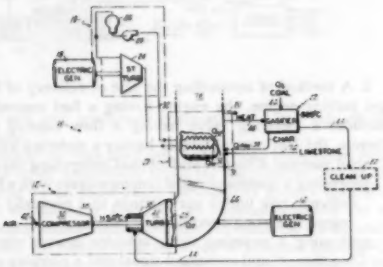
char in the partial gasifier such that the amount of combustible fluids produced has a heating value which lies in a range of sixty to eighty percent (60–80%) of the total heating value Q_t and the amount of char produced has a heating value Q_{char} equal to a percentage of the heating value of the coal fed into the partial gasifier;

burning the combustile fluids with the oxygen containing working medium gas of the gas turbine engine in the combustion chamber of the engine to produce a high temperature working medium gas;

expanding the working medium gases through the turbine of the gas turbine engine to power the output device of the gas turbine engine;

exhausting the working medium gas expanded through the turbine into the auxiliary combustor to provide oxygen and an amount of heat Q_e to the auxiliary combustor;

burning all of the char from the partial gasifier in an auxiliary combustor using the oxygen and the heat Q_e from the exhausted working medium gases to produce a high temperature gas;



transferring an amount of heat from the high temperature gas of the auxiliary combustor to the working medium fluid in the boiler of the steam turbine engine to raise steam, the amount of heat being equal to the summation of a first amount of heat Q_w which is less than Q_e, ($Q_w < Q_e$) and a second amount of heat Q_{sf} such that the amount of heat ($Q_{sf} + Q_w$) transferred to the working medium fluid in the boiler maximizes the efficiency of the combined cycle through supplementary firing;

expanding the working medium fluid through the turbine of the steam engine to power the output device of the steam turbine engine;

wherein the amount of char produced has a heating value Q_{char} equal to the amount of heat Q_{sf} transferred from the high temperature gas of the auxiliary combustor to the working medium fluid in the boiler of the steam turbine engine to raise steam ($Q_{char} = Q_{sf}$); wnerein the coal is consumed to produce energy and the turbine is isolated by the auxiliary combustor from harmful particulates produced by burning the char.

4,478,040

DUAL AREA NOZZLE ACTUATING MECHANICAL ACTUATION SYSTEM

Dell A. Johnson, Nibley, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,609
Int. Cl.³ F02K 9/12
U.S. Cl. 60—225 **5 Claims**

1. An automatic mechanical actuation system for a mechanically restrained supporting strut that is biased for endwise movement in a first direction by the pressure in a chamber as applied to a first end of said strut, comprising,

means providing a bore having an internal shoulder formed therein,

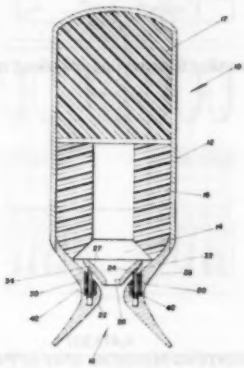
a circular row of ball bearings in said bore, one side of said row of ball bearings being supported by said shoulder in said bore,

said strut having a second end that extends into said bore and having a circular groove formed thereon which accommodates said circular row of ball bearings,

ball retainer ring means in said bore surrounding said supporting strut and supporting the other side of said circular row of ball bearings therein, said ball retainer ring means having by-pass vent means,

compression spring means in said bore in engagement with the ball retainer ring means therein, and

a retainer cap in said bore compressing said compression spring means to bias said ball retainer ring means to hold said circular row of ball bearings therein in the groove in said supporting strut, said retainer cap having vent means exposed to the pressure in the chamber, the by-pass vent means of said ball retainer ring means providing a much smaller orifice than the orifice of the vent means of said retainer cap, whereby



the space in said bore occupied by said compression spring means forms a first pressure cavity in which the pressure responds rapidly to changes in the pressure in the chamber, and the space in said bore between said ball retainer ring and the shoulder therein forms a second pressure cavity that is in communication through said smaller orifice by-pass vent means with the first pressure cavity so that the response of the pressure in the second pressure cavity to a change in the pressure in the chamber is substantially slower than that of the first pressure cavity, and as a result upon decrease in the pressure in the chamber a pressure differential is created on the opposite sides of the ball retainer ring means in said bore that moves said ball retainer ring means to release the circular row of ball-bearings from the groove in the supporting strut thereby to allow residual pressure in the chamber to move said supporting strut endwise in said first direction.

4,478,041

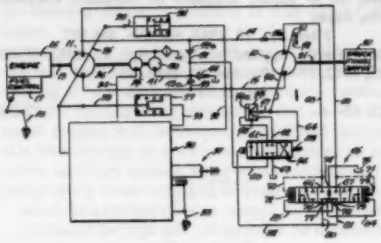
HYDRAULIC MOTOR CONTROL

Frederic W. Pollman, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 20, 1981, Ser. No. 294,640
Int. Cl.³ F16H 39/46
U.S. Cl. 60—444 **17 Claims**

1. A control for a variable displacement motor operable in either direction of rotation and having a movable member for setting motor displacement, positioning means including a servo member connected to said movable member for normally urging said movable member to a first position to set maximum motor displacement and for moving said movable member from said first position in response to a variable con-

trol signal, and means including a signal-setting valve operable in either direction of fluid flow through the motor and responsive to the rate of fluid flow therethrough for establishing said



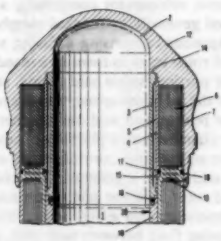
variable control signal generally proportional to said rate of fluid flow and which is applied to said member-positioning means.

4,478,042

CYLINDER LINER-REGENERATOR UNIT FOR A HOT GAS ENGINE

Stefan Lorant, Oxie, Sweden, assignor to United Stirling AB, Malmo, Sweden

Filed Oct. 29, 1982, Ser. No. 437,849
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—526 **8 Claims**



1. A cylinder liner-regenerator unit for a hot gas engine of the type in which each cylinder is surrounded by a regenerator having a ring shaped cross section said regenerator being adapted to axially abut a gas cooler also having a ring shaped cross section and surrounding the respective cylinder,

characterised in that said unit comprises a cylinder liner axial segment having two cylindrical wall elements of substantially equal length and interconnected near their ends, said elements being coaxially arranged and spaced from each other so as to leave a gap between them, the outer one of said wall elements being radially adjacent a surrounding regenerator having an axial length which is substantially shorter than the axial extension of said gap.

4,478,043

METHOD FOR CONTROLLING THE OPERATION OF AN HYDRAULIC ASSIST TURBOCHARGER

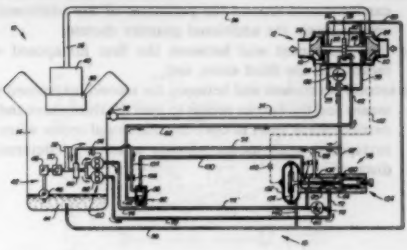
Robert J. Kobayashi, Rancho Palos Verdes, and Joe L. Byrne, Torrance, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 340,342, Jan. 18, 1982, Pat. No. 4,444,014.
This application Nov. 23, 1983, Ser. No. 555,115
Int. Cl.³ F02B *37/10*
U.S. Cl. 60—608 **19 Claims**

1. In a turbocharged engine system including an hydraulic turbine assist turbocharger having an exhaust gas driven turbine for supplementally driving the compressor, a method of controlling the supply of hydraulic fluid to the hydraulic turbine for rotatably driving the hydraulic turbine, comprising the steps of:

providing a plurality of hydraulic flow outputs from a plurality of pumping elements; and

movably positioning a control valve in response to at least one engine operating parameter for coupling the flow



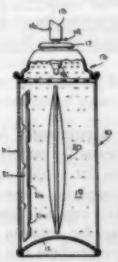
outputs to the hydraulic turbine during one condition of engine operation for maximum supplemental driving of the compressor, and for serially and progressively disconnecting the flow outputs of the pumping elements from the hydraulic turbine one at a time in response to changes in the parameter indicative of a reduced requirement for supplemental driving of the compressor.

4,478,044

INFLATABLE POUCH AND METHOD OF MANUFACTURE

David J. Magid, Doylestown, Pa., assignor to Enviro-Spray Systems, Inc., Montgomeryville, Pa.

Filed Aug. 5, 1981, Ser. No. 290,256
Int. Cl.³ B65D *5/42*
U.S. Cl. 60—721 **25 Claims**



1. An expandable, gas-tight pouch comprising:

first and second flexible, juxtaposed wall means to be spread apart by inflation of the pouch;

carrier means within the pouch and comprising a plurality of recesses to hold quantities of gas-forming chemical materials, a first one of the recesses holding a first one of the chemical materials, said first material comprising a water solution;

a rupturable, impermeable sheet sealed liquid-tight to the carrier means around the perimeter of the first recess to hold the first material therein until the sheet is ruptured;

a second one of the recesses holding a second one of the chemical materials;

a sheet of water-soluble material sealed to the carrier means around the perimeter of the second recess to retain the second chemical material therein, the water-soluble material being dissolved through in a predetermined time after being contacted by the first material, the materials in the

first and second recesses entering into a first reaction, when admixed, to form a first quantity of gas in the pouch;

an additional one of the recesses holding an additional quantity of at least one of the gas-forming chemical materials to form an additional quantity of gas within the pouch when admixed with the remainder of the material from the first reaction;

a third sheet of impermeable material releasably sealed to the carrier means around the perimeter of the additional recess to retain the additional quantity therein;

a first permanent seal between the first juxtaposed wall means and the third sheet; and

a second permanent seal between the second juxtaposed wall means and the carrier means to peel the third sheet and the carrier means apart to open the additional recess when the juxtaposed wall means spreads apart a predetermined distance.

4,478,045

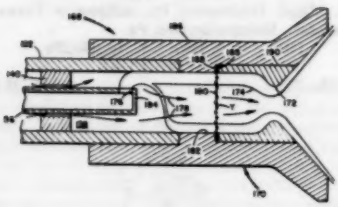
COMBUSTORS AND GAS TURBINE ENGINES EMPLOYING SAME

Jack Shekleton, San Diego, Calif., assignor to Solar Turbines Incorporated, San Diego, Calif.

Continuation-in-part of Ser. No. 128,199, Mar. 7, 1980, Pat. No. 4,343,147. This application Feb. 26, 1982, Ser. No. 352,531

Int. Cl.³ F02C *7/22*; F23R *3/20*

U.S. Cl. 60—737 **13 Claims**



1. In combination: a combustor having therein a hot gas recirculation zone; means for supplying a liquid fuel to said combustor; and means for supplying combustion air to said combustor, said fuel supplying means comprising a fuel atomizer including a rotatable cup, a hollow shaft, bearings supporting said shaft and cup for rotation about an axis generally coincident with the longitudinal axis of the combustor, means for rotating said shaft and said cup to spread into a thin film on the inner surface of the cup a liquid fuel supplied thereto and to then eject said fuel from the downstream edge of said cup as an annulus composed of fine droplets of controlled size, and means extending through said hollow shaft for delivering fuel to said atomizer, said combination further comprising means for preventing fuel from backing up through the passage between said fuel delivering means and said shaft and consequentially adversely affecting said bearings, said last-mentioned means comprising air passage means communicating with the interior of the hollow shaft at a location upstream from the rotatable cup through which buffer air can flow from the combustor into said shaft to reduce the pressure differential therebetween, and means in said rotatable cup for reducing the velocity of the buffer air flowing through said shaft to keep said air from disturbing the film of fuel formed on said rotatable cup and/or to keep said air from penetrating to said recirculation zone and thereby interfering with the combustion process.

4,478,046

CRYOGENIC REFRIGERATOR

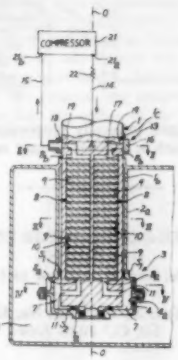
Hidefumi Saito, Osaka; Munehiro Hayashi, Kyoto; Hisashi Mitani, Osaka; Hironu Isaka, and Masanao Andoh, both of Kyoto, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Apr. 19, 1983, Ser. No. 486,307

Claims priority, application Japan, Apr. 22, 1982, 57-68489; Apr. 22, 1982, 57-68490; Jan. 29, 1983, 58-13204

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **17 Claims**



1. A cryogenic refrigerator comprising: a rotor in the form of an elongated generally cylindrical member rotatable about an axis; an expander comprising a casing surrounding a first portion of said rotor so as to form an expander chamber about said first rotor portion within said casing, said chamber being sealed against the adjacent space, and means associated with said first rotor portion and said casing inner wall for dividing said expander chamber into a plurality of compartments which vary in volume and relative position in said casing as said rotor rotates about said axis; a regenerator associated with a second portion of said rotor adjacent said first rotor portion and having a low-temperature and a high-temperature end and being capable of passing fluid between said ends, said low-temperature end being disposed adjacent said expander compartments for fluid communication between said regenerator and said expander compartments; and means associated with said high-temperature end of said regenerator for supplying compressed gas to, and receiving expanded gas from said expander compartments through said regenerator, whereby said compressed gas introduced successively into said expander compartments expands adiabatically as said compartments successively increase in volume.

4,478,047

ENERGY EFFICIENT GLASS DOOR MERCHANDISER

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation of Ser. No. 145,712, May 1, 1980, Pat. No. 4,325,227, which is a continuation-in-part of Ser. No. 25,473, Mar. 30, 1979, Pat. No. 4,245,482, which is a continuation-in-part of Ser. No. 58,916, Jul. 19, 1979, Pat. No. 4,242,882, which is a continuation-in-part of Ser. No. 101,069, Dec. 7, 1979, Pat. No. 4,265,090, and Ser. No. 124,544, Feb. 25, 1980, Pat. No. 4,389,852. This application Feb. 16, 1982, Ser. No. 349,323

The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.

Int. Cl.³ F25D *21/12*

U.S. Cl. 62—82 **41 Claims**

1. A glass door refrigerated display case comprising:

a cabinet having top, bottom, rear and front walls and an

interior display space, with an access opening in said front wall for enabling access into said interior display space;

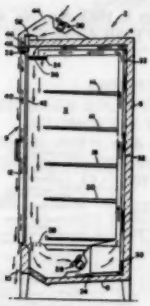
at least one glass door covering said access opening in said front wall, said door being movable into an open position for enabling access to products in said interior display space;

a refrigeration air conduit extending along said top, bottom and rear walls and having an outlet opening and an inlet opening at opposing ends thereof, said outlet opening and said inlet opening being arranged so that air leaving said outlet opening will be directed toward and received by said inlet opening so as to form a refrigerated air curtain across said front opening along a path inside of said door;

refrigeration means including an evaporator coil arranged within said refrigeration air conduit for refrigerating air circulated through said refrigeration air conduit during a refrigeration cycle of operation;

first air circulating means for circulating air through said refrigeration air conduit; and,

a secondary air conduit extending at least partially around said refrigeration air conduit and having an outlet opening adjacent to said outlet opening of said refrigeration air



conduit for directing air across said access opening along a path inside of said glass door so as to form a secondary air curtain.

29. A method of operating a glass door refrigerated display case having a cabinet with an access opening in its front wall for enabling access into an interior display space within the cabinet, at least one glass door covering the access opening, such glass door being movable into an open position for enabling access to products within the interior display space and having two glass members mounted within a frame with a space between such glass members, a refrigeration air conduit extending along the cabinet with an outlet opening and an inlet opening arranged at opposing ends of the access opening, the method comprising the steps of:

circulating air through the refrigeration air conduit with such air being emitted from the outlet opening, directed across the access opening and received back into the inlet opening during a refrigeration cycle of operation;

refrigerating the air circulated through the refrigeration air conduit during a refrigeration cycle of operation; and,

circulating ambient air through the glass door outside the glass members so as to minimize any accumulation of condensation within the glass door.

4,478,048

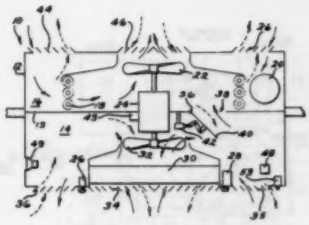
AIR SENSING CONTROL SYSTEM FOR AIR CONDITIONERS

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 5, 1984, Ser. No. 586,051

Int. Cl.³ F24F 7/00; F25B 49/00

U.S. Cl. 62—126 **4 Claims**



1. In a unitary air conditioning unit for conditioning the air in an enclosure including a housing, a partition within said housing dividing said housing into interior and exterior chambers, an outdoor heat exchanger arranged in said exterior chamber adjacent an outlet in said housing, an indoor heat exchanger arranged in said interior chamber, a fan motor arranged in said portion including a fan means in a said exterior chamber for circulating outdoor air through said external chamber, and a fan means in said interior chamber for circulating enclosure air through said chambers; reversing means for electrically changing rotational direction of air flow through said chambers; a vent opening in said partition, a damper including electrically operated means for moving said damper between a closed and open position for allowing an exchange of air between said chambers; an air sensing system in said air conditioning unit comprising:

sensing means located in said housing for sensing the level of humidity and concentration of gases in the air circulating said enclosure, having a first condition for generating electrical signals having values indicative of the level of humidity in said circulating enclosure air contacting said sensing means, and a second condition for generating electrical signals having values indicative of a first level of concentrations of gases in the circulating enclosure air, and a third condition for generating electrical signals having values indicative of a second level of concentration of gases in said circulating enclosure air; and

decision means operable in said first condition for causing said electrically operated damper means for moving said damper to an open position and for causing said reversing means to set rotational direction of said fan motor so that said fan means are operable for introducing outdoor air to said interior chamber to be mixed with said enclosure air;

decision means operable in said second condition for causing said reversing means to set rotational direction of said fan motor so that said fan means are operable for exhausting enclosure air into said circulating outdoor air; and

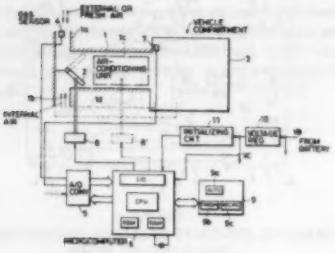
decision means operable in said third condition including warning means operable when the level of concentration of gases in the circulating enclosure air is greater than the correction capability of the system;

warning means operative for producing user discernable signal when the level of concentration of gases in the circulating enclosure air increases above a predetermined level.

4,478,049
AIR-CONDITIONING CONTROL FOR A MOTOR VEHICLE

Tomonori Fukui, Kariya, and Osamu Eguchi, Kuwana, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 13, 1982, Ser. No. 417,611
Claims priority, application Japan, Sep. 15, 1981, 56-145675; Apr. 13, 1982, 57-62193; Jul. 30, 1982, 57-134371
Int. Cl.³ B60H 1/24; F24F 7/06
U.S. Cl. 62—179 11 Claims



1. An air conditioning system for use with a motor vehicle, comprising:

(a) an air-conditioning unit arranged to control the temperature of air in the compartment of said motor vehicle by either introducing external air on recirculating internal air in said compartment;

(b) switching means for switching the airflow led to said air-conditioning unit so that one of said external and internal air is led to said air-conditioning unit in accordance with a control signal;

(c) means for producing an output signal indicative of the concentration of a gas component included in said external air which may be led into said vehicle compartment; and

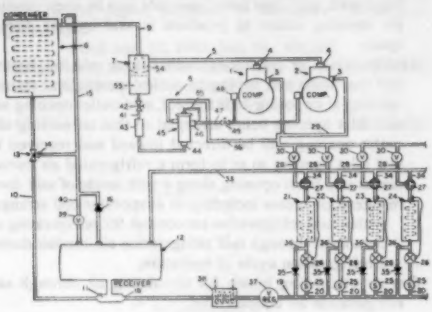
(d) controlling means responsive to said output signal for producing said control signal so that said switching means is controlled such that said internal air is led to said air-conditioning unit when said level of said output signal is equal to or greater than a predetermined value, said controlling means being arranged to change said predetermined value in accordance with the number of times of detecting that said level is greater than or equal to said predetermined value and the number of times of detecting that a predetermined period of time has lapsed after said level becomes below said predetermined value.

4,478,050
OIL SEPARATION FOR REFRIGERATION SYSTEM

Leonard J. DiCarlo, Maryland Heights; Roland A. Ares, St. Charles, and Robert O. Norton, Chesterfield, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.

Filed Nov. 19, 1982, Ser. No. 442,967
Int. Cl.³ F25B 31/00, 43/02
U.S. Cl. 62—193 15 Claims

1. An oil separation system for a refrigeration system having compressor, condenser-receiver and evaporator means, comprising an oil separator unit disposed in the refrigerant gas discharge line between said compressor means and said condenser-receiver means, said oil separator unit having a receiving chamber constructed and arranged to receive the refrigerant gas discharge from said compressor means and separate oil therefrom by centrifugal vortex action, means for precipitating vaporous separated oil into liquid form, oil reservoir means for storing liquid oil, and oil delivery means connecting said oil reservoir to said compressor means including oil level control means responsive to the compressor oil level and pressure differential valve means including means responsive to oil outlet pressure therefrom and compressor suction pressure acting in opposition for reducing the high side inlet oil pressure

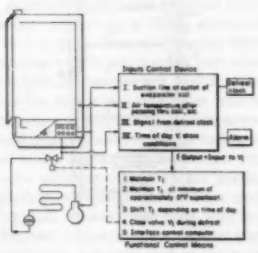


to a preselected low side pressure differential for regulating oil delivery to said oil level control means.

4,478,051
ELECTRONIC TEMPERATURE CONTROL SYSTEM

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Filed May 6, 1983, Ser. No. 492,486
Int. Cl.³ F25B 41/00; G05D 23/00
U.S. Cl. 62—212 36 Claims



1. A refrigeration control system for a refrigeration system including a refrigerated display case with a primary air conduit having an air outlet opening and an air inlet opening, an evaporator coil arranged within the primary air conduit for refrigerating air passing through such conduit, and an expansion valve coupled to the inlet end of the evaporator coil, said refrigeration control system comprising:

a pressure sensing means arranged at the refrigerant discharge line from the evaporator coil for sensing the pressure (P) of the refrigerant within such discharge line;

means for determining the saturation temperature (T_{sat}) of the refrigerant from the measurement of pressure P;

means for setting a level of superheat (T_{sh}) desired within the refrigerant discharged from the evaporator coil and setting a desired temperature (T_{2set}) for such discharge refrigerant by

$$T_{2set}=T_{sat}+T_{sh}$$

a second temperature sensing means arranged adjacent to the refrigerant discharge line from the evaporator coil for measuring the temperature (T_2) of the refrigerant discharged from the evaporator coil;

comparator means for comparing temperature T_2 with temperature T_{2set} and providing an output comparison signal if $T_2<T_{2set}$; and,

control means receiving the output comparison signal and

providing an output control signal for controlling operation of the refrigeration system for maintaining temperature T_2 equal to or above temperature T_{2set}.

6. A refrigeration control system for a refrigeration system including a refrigerated display case with a primary air conduit having an air outlet opening and an air inlet opening, an evaporator coil arranged within the primary air conduit for refrigerating air passing through such conduit, and an expansion valve coupled to the inlet end of the evaporator coil, said refrigeration control system comprising:

first temperature sensing means arranged at the air discharge side of the evaporator coil for sensing the temperature (T_1) of the air that has passed over the evaporator coil;

a second temperature sensing means arranged adjacent to the refrigerant discharge end of the evaporator coil for measuring the temperature (T_2) of the refrigerant discharged from the evaporator coil;

comparator means for comparing temperature T_1 with temperature T_2 to determine if temperature T_1 is greater than temperature T_2 by a preselected temperature differential;

means for setting a desired temperature differential between temperature T_1 and temperature T_2 for maintaining temperature T_1 sufficiently above temperature T_2 to assure that the refrigerant discharged from the evaporator coil is above its saturation temperature; and,

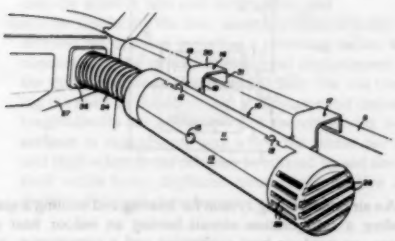
control means to provide an output control signal for controlling operation of the refrigeration system for maintaining temperature T_1 sufficiently above temperature T_2 by at least the set temperature differential.

4,478,052

FOOD STORAGE RECEPTACLE FOR USE IN AUTOMOTIVE VEHICLE

Robert A. McDowell, 1920 N. 48th Ave., Hollywood, Fla. 33021

Filed Sep. 23, 1983, Ser. No. 535,222
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—244 **14 Claims**



1. A beverage can storage receptacle for use in the passenger compartment of an automotive vehicle comprising:

a housing having a hollow interior;

can support members in said housing for holding individual beverage cans substantially horizontal;

said housing having a cover which is displaceable to expose the interior of the housing for removal of the cans;

and hanger means on the back of said housing for hanging the housing on the inside of the passenger compartment of the vehicle;

said housing having an air inlet for connection to an air vent in the passenger compartment and having air outlet means for venting air from its interior;

said can support members being spaced apart horizontally along said housing;

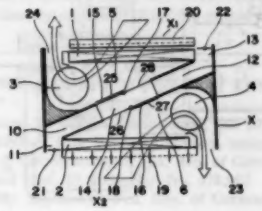
and each of said can support members presenting an upwardly-facing recess shaped and dimensioned to snugly receive the side wall of a beverage can.

4,478,053

AIR-CONDITIONING MACHINE

Nobuyuki Yano, Hirakata; Takuro Kotera, Kawanishi; Akira Aoki, Neyagawa, and Toshio Utagawa, Hirakata, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 5, 1983, Ser. No. 482,170
Claims priority, application Japan, Apr. 5, 1982, 57-56348
Int. Cl.³ F25D *23/12*; F25B *29/00*
U.S. Cl. 62—262 **10 Claims**



1. An air-conditioning machine, comprising

a. a casing having therein first, second, and third compartments, respectively defining an indoor air circulation passage, an outdoor air circulation passage and a ventilation passage between said indoor air circulation passage and said outdoor air circulation passage;

b. an indoor heat exchanger adjacent said indoor air circulation passage, and first air drawing means, in said indoor air circulation passage, for drawing indoor air through said indoor heat exchanger and circulating the indoor air through said indoor air circulation passage;

c. an outdoor air heat exchanger adjacent said outdoor air circulation passage, and second air drawing means in said outdoor air circulation passage, for drawing outdoor air through said outdoor air heat exchanger and circulating the outdoor air through said outdoor air circulation passage;

d. a central heat exchanger of the opposite air flow type disposed in said ventilation passage between said indoor and outdoor circulation passages having first and second openings on opposite sides thereof providing, when open, fluid communication therethrough between said indoor and outdoor air circulation passages, and third and fourth openings on opposite sides of said central heat exchanger providing, when open, fluid communication therethrough between said indoor and outdoor air circulation passages; and

means, including dampers for opening and closing at least one each of said first and second openings and of said third and fourth openings, on opposite sides of said central heat exchanger;

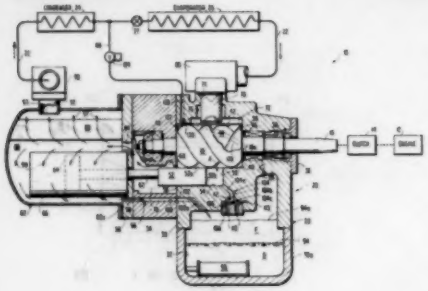
said ventilation passage including an indoor air exhaust passage in fluid communication at one end thereof with said third opening along a first path through said central heat exchanger, and an outdoor air supply passage in fluid communication at one end thereof with said second opening along a second path through said central heat exchanger; said first and second paths extending through said central heat exchanger in heat exchanging relation to one another.

4,478,054

HELICAL SCREW ROTARY COMPRESSOR FOR AIR CONDITIONING SYSTEM HAVING IMPROVED OIL MANAGEMENT

David N. Shaw, Unionville, and Clifford T. Bulkley, Glastonbury, both of Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jul. 12, 1983, Ser. No. 513,182
Int. Cl.³ F25B 27/00
U.S. Cl. 62—323.4 8 Claims



8. In combination, a closed loop refrigeration system for an engine driven motor vehicle, said closed loop refrigeration system comprising:

a helical screw rotary compressor,

a condenser,

an evaporator,

conduit means connecting said compressor, said condenser and said evaporator in a closed loop series refrigeration circuit, in that order, and an expansion valve means within said conduit means upstream of said evaporator,

said compressor comprising a housing including intersecting parallel bores, intermeshed helical screw rotors mounted for rotation within said bores, said rotors including integral shafts,

anti friction bearing pack assemblies carried by said housing, about said shafts for rotatably supporting said intermeshed helical screw rotors for rotation about the shaft axes,

a recess underlying said rotors and open to said rotors,

a slide valve slidably mounted in said recess,

said housing defining a low pressure suction port open to said intermeshed helical screw rotors at one end of said rotors and a high pressure discharge port at the opposite end of said rotors,

said slide valve being slidably mounted in said recess for selectively closing off the recess at an end proximate to said suction port,

a mass of refrigerant provided within said closed loop system,

an oil sump bearing a mass of oil, and defined by said housing underlying the intermeshed helical screw rotors and the slide valve.

means for supplying oil under pressure to said bearings for lubrication of the bearing,

such that oil lubricating the bearings adjacent to the suction port tends to move into the compressor area under pressure differential between the discharge port and the suction port,

said vehicle comprising an internal combustion engine,

clutch means mechanically connecting said engine to one of said rotor shafts for driving said intermeshed helical screw rotors about their axes,

the improvement comprising:

said sump being of a capacity of at least the volume of the oil required for lubrication of the compressor and the mass of refrigerant when in liquid form,

said compressor further comprising first gravity flow oil drain passage means operatively connecting the discharge port to the sump for causing said sump to be at discharge pressure during normal operation of the compressor, and

second oil drain passage means leading from the recess to the sump, and

a ball check valve within said second oil drain passage means for permitting oil and liquid refrigerant draining back to the compressor upon shut down of the refrigeration system from said evaporator to drain from the recess into the oil sump but preventing reverse flow;

whereby, during compressor shut down, the refrigerant may freely condense and be totally absorbed in the oil and fill said sump without liquid flooding of the intermeshed helical screw rotors and hydraulic locking of the rotors to prevent damage to the clutch means or engine upon compressor start up,

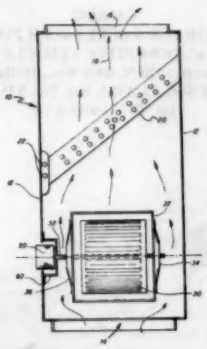
and wherein, during start up, the slide valve recess is cut off from the oil sump to prevent refrigerant blow by from the discharge port side of the compressor through the first oil drain passage means to the sump and from the sump via said second oil drain passage means to the suction port of said compressor.

4,478,055

METHOD AND APPARATUS FOR IMPROVING HEAT PUMP PERFORMANCE BY CONTROLLING DISCHARGE OF INDOOR FAN THERMAL ENERGY

Alan S. Drucker, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,382
Int. Cl.³ F25B 13/00
U.S. Cl. 62—324.1 5 Claims



3. An air conditioning system for heating and cooling a space including a refrigeration circuit having an indoor heat exchanger, an outdoor heat exchanger and a compressor, said indoor heat exchanger being mounted within a casing defining a portion of an air flow path to the space to be conditioned and a fan for circulating air to the enclosure which comprises:

a fan motor mounted at least partially within the casing within the air flow path of the air circulated to the space to be conditioned and connected to power the fan to circulate air between the indoor heat exchanger and the space to be conditioned;

control means for selectively operating the refrigeration circuit to either absorb thermal energy at the indoor heat exchanger from the air circulated to the space to be conditioned when cooling is desired or for discharging thermal energy to the air circulated to the space to be conditioned from the indoor heat exchanger when heating is desired;

air flow routing means for routing the air circulated to the space in heat exchange relation with the fan motor absorbing thermal energy therefrom when heating is desired and for routing the air circulated to the space to bypass the fan motor when cooling is desired; and

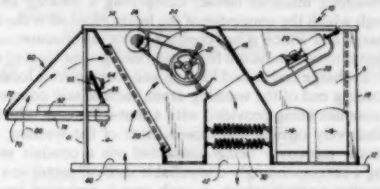
a cover means for encasing the fan motor within the casing to divert the air flow within the casing to substantially reduce the transfer of thermal energy from the fan motor to the air circulated to the space to be conditioned when cooling is desired.

4,478,056

ECONOMIZER CONTROL ASSEMBLY FOR REGULATING THE VOLUME FLOW OF OUTDOOR AMBIENT AIR

Donald D. Michaels, Jr., Manchester, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,404
Int. Cl.³ F25B *25/00*
U.S. Cl. 62—332 6 Claims



1. An air conditioning unit having a refrigeration circuit for transferring heat energy between air being circulated through the unit to a space to be conditioned and another fluid which comprises:

an economizer including a frame defining a horizontal, downwardly facing opening for an air flow path for allowing outdoor ambient air to enter the air conditioning unit;

a sliding non-rotating door assembly for selectively covering at least a portion of the opening defined by the frame to regulate the flow of outdoor ambient air through the economizer said sliding non-rotating door assembly horizontally slidable into said economizer; and

means for displacing the door assembly relative to the frame defining the opening including a reversing motor, a shaft connected to the motor for rotational displacement about the shaft's longitudinal axis, and at least one rod connecting the shaft to the door, said at least one rod including a longitudinally extending aperture therein having interior surfaces in engagement with a first flat planar portion of said shaft wherein the rod may be rotated by and about the shaft while being displaced transversely relative to the shaft to slide said door between positions.

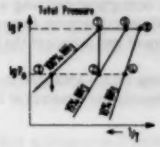
4,478,057

CONTINUOUSLY OPERATING AN ADSORPTION REFRIGERATION PLANT, ESPECIALLY FOR OPERATION BY WASTE HEAT OF COMBUSTION ENGINES OR THE LIKE

Helmut Lotz, Gingen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 521,707
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1982, 3229646
Int. Cl.³ F25B *17/08*
U.S. Cl. 62—480 14 Claims

1. Continuously operating adsorption refrigeration plant, comprising a gas-tight housing having at least one expeller chamber and at least one adsorption chamber disposed therein sequentially following each other in a closed loop, sealing gates disposed between said chambers for preventing an uninhibited exchange of gaseous coolant between said chambers, an endless structure disposed in said housing including carries for solid adsorbent of a coolant and connection members spacing



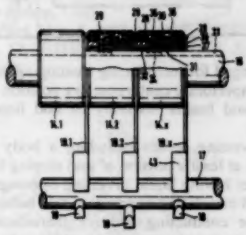
said carriers apart from each other, said carriers being movable one after the other through said chambers of said housing.

4,478,058

TAKE DOWN MECHANISM FOR FLAT KNITTING MACHINES

Günther Kazmaier, St. Johann-Ohnastetten, and Ernst Goller, Reutlingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,998
Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217395
Int. Cl.³ D04B *7/04*
U.S. Cl. 66—149 R 8 Claims



1. A take-down mechanism for flat knitting machines comprising a fabric take-down roller which cooperates with a press roller and is divided into a plurality of coaxial component roller sections with profiled surfaces, characterised by the fact that all the component roller sections (14.1 . . . 14.x) are mounted for unidirectional rotation on a common shaft (16) which is normally held stationary, and each roller section (14.1 . . . 14.x) can be coupled separately and selectively with a driving means (17/18).

4,478,059

ADDITIVE DISPENSER SYSTEM FOR CLOTHES WASHING APPLIANCE

Roy K. Yates, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 12, 1983, Ser. No. 530,908
Int. Cl.³ D06F *39/02*
U.S. Cl. 68—17 A 9 Claims

1. An additive dispensing system for a clothes washing appliance of the vertical axis type, comprising:

an imperforate outer tub for retaining washing liquid;

a basket mounted in the tub for containing clothes to be washed having a perforate side wall and a bottom wall including liquid circulating openings, said bottom wall sloping downwardly from an upper position adjacent said vertical axis to a lower portion adjacent said side wall;

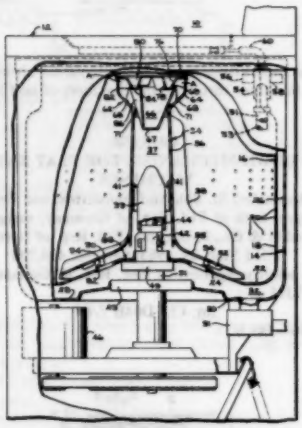
an agitator mounted in said basket on said vertical axis for rotation with said basket;

drive means for effecting a relatively low rotational speed

oscillation of said agitator during a washing action of said clothes and a high spin speed rotation of said basket during spin extraction action;

said agitator including housing means in the form of a hollow imperforate centerpost defining a conduit extending through said hollow centerpost between an open upper end to an open lower end adjacent the bottom wall of said basket;

an additive dispensing means arranged in the open upper end of said hollow imperforate centerpost including a passage-



way arranged for introducing treating agent through said hollow imperforate centerpost to a position on the bottom wall of said basket inwardly of said liquid circulating openings;

additive diverting means including a body portion positioned on at least a portion of said sloping bottom wall of said basket having liquid diverting openings aligned with said liquid circulating openings in said bottom wall of said basket for conducting additive therethrough into said outer tub to thereby cause said additive to mix with said washing liquid retained in said outer tub.

4,478,060

CONTINUOUS WASHING MACHINE

Heinz Grunewald, Bremen, Fed. Rep. of Germany, assignor to Engelhardt & Forster KG, Bremen, Fed. Rep. of Germany

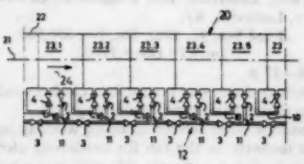
PCT No. PCT/DE80/00183, § 371 Date Aug. 5, 1981, § 102(e) Date Aug. 5, 1981

PCT Filed Dec. 6, 1980, Ser. No. 293,208

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949228

Int. Cl.³ D06F *31/00*

U.S. Cl. 68—27 **6 Claims**



1. A continuous washing machine for the washing of laundry batches of, for example, white and colored laundry items, comprising a washing drum which has a longitudinal axis, a loading end and a discharge end, and contains a washing liquid and is propellable about its longitudinal axis and has laundry compartments which are substantially separated from each other with respect to said washing liquid, each of said compartments being connected to an adjacent laundry compartment by a countercurrent conduit and laundry items being transported from one of said compartments to the next, whereby during the transporting of the laundry items from one laundry compartment to the next one a partial current of liquid supplied to the laundry compartment located adjacent the discharge end of the washing drum is conducted in countercurrent to the laundry supplied batchwise at said loading end of the drum, said laundry traversing the laundry compartments cyclically and consecutively through the washing machine, said liquid countercurrent being a part of a liquid fed into the washing machine at the discharge end of the drum via a feed conduit, said drum further including a rinsing zone located at the discharge end and a loading and soaking zone located at the loading end, and said washing machine further comprising a soaking conduit through which the remainder of the liquid supplied at the drum discharge end which is not conducted via said countercurrent conduit is to be conducted from said rinsing zone located at the drum discharge end to said loading and soaking zone located at the loading end of the washing drum, each of said countercurrent conduits being provided with a shut-off means which can be selectively opened and closed; each of the washing compartments moreover being connected via a conduit section having a correspondingly controllable shut-off means to a joint connective conduit which in each case is provided between said conduit sections of two adjacent compartments with a correspondingly controllable shut-off means; and a program-controlled control installation connected to the shut-off means for opening and/or closing in such a manner that the countercurrent liquid is to be conducted around at least one of said washing compartments and no liquid enters another washing compartment from this bypassed washing compartment.

4,478,061

CYLINDER LOCK

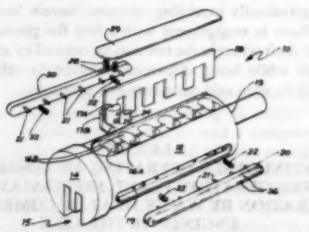
Brian F. Preddey, Miranda, Australia, assignor to Taboola Pty. Limited, New South Wales, Australia

Filed Mar. 29, 1982, Ser. No. 362,797

Claims priority, application Australia, Mar. 30, 1981, PE8207; Jul. 8, 1981, PE9648

Int. Cl.³ E05B *27/06*

U.S. Cl. 70—358 **9 Claims**



1. A barrel for a cylinder lock, said barrel comprising a generally cylindrical barrel body having end faces, a keyway formed in said barrel body and extending longitudinally inwardly from one end face, a plurality of guide bores formed in the barrel body and extending outwardly from said keyway so as to communicate therewith, a single lock pin slidably received within each said bores and retained therein so as to be movable longitudinally thereof from a position projecting into said keyway to a retracted position, with each pin being prevented from rotation about the longitudinal axis of the bore, said bores being grouped in two sets with the bores of each set being aligned longitudinally so that the two sets are ranged in a space generally parallel co-extensive relationship, two side

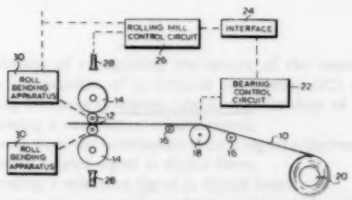
bar slots formed in opposite sides of the body so as to extend longitudinally thereof, said body further having a passage extending from each bore so that the passages are arranged in two sets with each set of passages terminating at a particular side bar slot, the recesses of each pin being selectively alignable with the passage extending from the bore of the respective pin, and wherein said barrel further includes a side bar slidably located in each slot so as to be movable from a radially outer locking position to a radially inner release position, and each said side bar has a plurality of projections which are located in said passages and extend therethrough so as to be selectively locatable within the recesses of the pins to enable movement of the side bars to said release position.

4,478,062

STRIP SHAPE MEASURING ROLL

Paul E. Huzyak, Salem, Ohio, assignor to E. W. Bliss Company, Inc., Salem, Ohio

Filed Sep. 1, 1982, Ser. No. 413,863
Int. Cl.³ B21B *37/06*
U.S. Cl. 72—17 **2 Claims**



1. In a system for controlling the forces exerted on a metal strip as it is being pulled by a coiler between work rolls in a given path extending between the work rolls and said coiler, said system including an elongated shape sensing roll extending generally perpendicular to said path between said work rolls and said coiler with a lower side opposite to said path; means for passing said strip over said sensing roll at a preselected wrap angle whereby the tension in said strip between said work rolls and said coiler causes a corresponding applied force between said strip and said sensing roll in a direction toward said lower side; said sensing roll including a plurality of axially spaced elements each having a rotatable ring with an outer surface rotatable about a common axis with said outer surfaces being aligned when said rings are in their normal positions and with each ring surface adapted to engage said strip at the side of said roll opposite to said lower side, feed back means developing a signal for each of said axially spaced elements, said signals having magnitudes indicative of displacement of each ring from its normal position with respect to said common axis; and, means responsive to said signals for controlling said work rolls to control the forces exerted on said strip, the improvement comprising: each of said axially spaced elements of said sensing roll being an independent, active magnetic bearing having an inner generally fixed element for supporting one of said rotatable rings, each of said fixed elements having magnetic elements adjacent said lower side only for pulling one of said rings in a direction opposite to the direction of said applied force; each of said magnetic bearings having (a) means for preventing engagement between said fixed element and said rotatable rings and (b) means for sensing the spacing between said fixed elements and said rotatable ring of each bearing; means for linearizing said displacement indicative signal to generate a corrective signal indicative of the applied force between said fixed element and said rotatable ring of each bearing; means for magnetically supporting said ring by a variable magnetic force exerted in a direction toward said strip in accordance with the magnitude of said corrective signal whereby said rings of each of said magnetic bearings are held in said normal position with said outer surfaces concentric with said axis and means for controlling the rolls in accordance with exerted magnetic force.

4,478,063

HOT-ROLLING MILL AND METHOD

John C. Duke, Hickory, N.C., assignor to Southwire Company, Carrollton, Ga.

Filed Dec. 18, 1981, Ser. No. 332,052
Int. Cl.³ B21B *27/10*
U.S. Cl. 72—42 **12 Claims**

1. A method of hot rolling non-ferrous metals in a rolling mill having a plurality of tandem roll stands each supporting work rolls comprising the steps of:

providing nonpolar conversion coating working surfaces on said work rolls of said roll stands containing products of corrosion selected from a group comprising phosphates, chormates, oxides and combinations thereof;

applying nonpolar naphtenic mineral oil lubricant to said nonpolar working surfaces; and

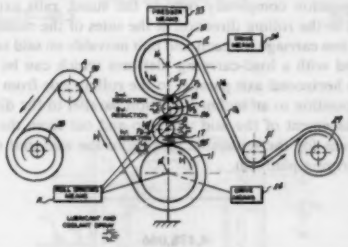
hot rolling said metal while chemically and physically retaining said lubricant on said conversion coated nonpolar working surfaces.

4,478,064

MODIFICATIONS TO A COOPERATIVE ROLLING SYSTEM FOR INCREASING MAXIMUM ATTAINABLE REDUCTION PER PASS

William L. Brenneman, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 4, 1982, Ser. No. 355,090
Int. Cl.³ B21B *1/22, 29/00, 37/08, 31/32*
U.S. Cl. 72—232 **19 Claims**



1. A process for rolling metal or metal alloy material and increasing the maximum reduction in material thickness obtainable per pass, said process comprising:

providing a rolling mill having a plurality of rolls forming a plurality of roll bites through which said material passes, at least one of said rolls forming two of said roll bites with at least two adjacent one of said rolls;

passing said material through said mill in a serpentine arrangement;

applying a compressive force of predetermined magnitude to said rolls to create a separating force having a desired magnitude and obtain a reduction in said material thickness at each of said roll bites; and

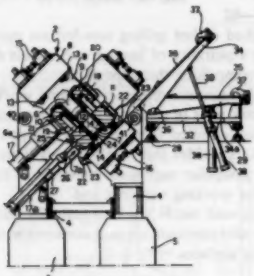
subjecting said material to increasing separating forces as said material passes from an entry one of said roll bites to an exit one of said roll bites while maintaining the magnitude of said compressive force substantially constant, said subjecting step comprising reducing the magnitude of said separating force applied to said material at at least one of said roll bites by creating a reducing force having a desired magnitude at said at least one roll bite.

4,478,065

CONTINUOUS ROLLING MILL WITH CROSSED STANDS FOR THE PRODUCTION OF SEAMLESS TUBES

Emanuele Gancia, Pioltello, and Cesare Galletti, S. Felice di Segrate, both of Italy, assignors to Innse Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Jun. 10, 1982, Ser. No. 387,256
Claims priority, application Italy, Jun. 11, 1981, 22255 A/81
Int. Cl.³ B21B *31/08*
U.S. Cl. 72—239 7 Claims



1. A continuous rolling mill of the crossed stand type for the production of seamless tubes comprising: a plurality of successive rolling stands inclined alternately to the rolling axis, in which each stand includes an upper working roll, a lower working roll and respective roll chocks for said rolls which together form a unit; means for displacing each said unit individually at least in a direction parallel to the axes of rotation of the rolls; means for the guided displacement of the said unit in the said direction between its position within the rolling stand and a position completely outside the stand; rails extending parallel to the rolling direciton at the sides of the rolling mill; at least one carriage for each said unit movable on said rails and provided with a load-carrying platform which can be tipped about a horizontal axis parallel to the rolling axis from a horizontal position to an inclined position parallel to the direction of displacement of the said unit into and out from the stand; and means for the releasable locking of the said unit on said load-carrying platform.

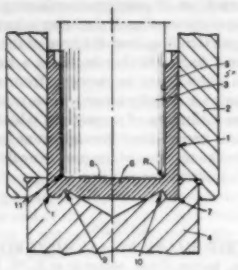
4,478,066

METHOD OF MAKING A THIN-WALLED BEARING BUSHING

Armin Olschewski, Schweinfurt; Hermann Hetterich, Heidenfeld, and Peter Horling, Mainberg, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Division of Ser. No. 218,520, Dec. 22, 1980, Pat. No. 4,377,313. This application Sep. 24, 1982, Ser. No. 423,129
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952092
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—358 2 Claims

1. A deep drawing method for making a thin-walled bearing bushing from a flat circular member comprising a cylindrical sleeve section and a bottom section closing one end of the sleeve section having an outer peripheral rim at the juncture of the sleeve and bottom sections of small cross sectional radius consisting of the steps of cold pressing the bottom section and deep drawing the sleeve section in a single press stroke in the bore of a generally cylindrical die by a drawing ram engaging in the bore of the die and a cooperating counter ram positioned at the open end of the die confronting the bottom section, and simultaneously impressing an annular groove in one face of the bottom section closely adjacent the junction of the bottom and sleeve sections to effect radial outward displacement of the



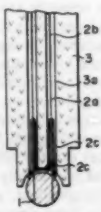
material in the bottom section into the area of the peripheral rim and uniform compression thereof in this area.

4,478,067

GAS COMPOSITION SENSOR

Minoru Ohta; Eturo Yasuda, both of Okazaki; Tomio Kawakami, Nishio, and Yoichi Kotanshi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 23, 1981, Ser. No. 286,346
Claims priority, application Japan, Jul. 28, 1980, 55-104049
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 5 Claims



1. In a gas composition sensor including a gas sensor element for providing an electric resistance value corresponding to the composition of an exhaust gas to be sensed, a pair of electrodes for detecting said electric resistance value and a ceramic body holding said gas sensor element therein and including a pair of holes formed therethrough and receiving said pair of electrodes to extend therethrough, the improvement wherein at least one layer of a dense material substantially impervious to the exhaust gas is formed on said electrodes and on contacting portions between said electrodes and said gas sensor element, whereby said contacting portions and said electrodes are covered with said layer, thereby to be isolated from the exhaust gas and prevented from contacting thereto.

4,478,068

INTERNAL COMBUSTION ENGINE KNOCK SENSING METHOD AND SYSTEM

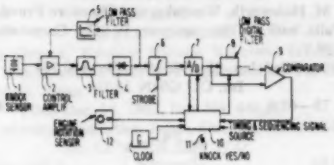
Jörg Bonitz, Mühlacker; Robert Entenmann, Benningen; Rochus Knab, Kornwestheim; Bernhard Miller, Stuttgart; Siegfried Rohde, Schwieberdingen; Herbert Schramm, Stuttgart, and Walter Viess, Illingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,629

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137016

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 17 Claims



1. Method of recognizing the nature of the combustion process in operation of an internal combustion (IC) engine, including knocking operation, comprising the steps of

generating a combustion-related signal;

deriving from the combustion-related signal a derived combustion related signal in digital form;

generating a reference signal in digital form;

comparing the combustion-related signal and the reference signal to obtain an output signal representative of the nature of the combustion process,

and wherein

the step of generating the reference signal includes digitally filtering the derived digital combustion signal by passing the combustion signal through a digital low pass filter;

the step of comparing the signals comprises comparing the digitally filtered combustion-related signal with the actual combustion-related signal;

and wherein the step of generating the reference signal includes the step of modifying the filtering function of the digital filter by a factor k, said factor k being a weighting factor which varies on an engine operating parameter comprising at least one of:

engine speed;

engine loading;

knocking, or non-knocking operation of the engine.

4,478,069

FLOW RESISTIVITY INSTRUMENT IN THE EARTH

Allan J. Zuckerwar, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 27, 1983, Ser. No. 508,372

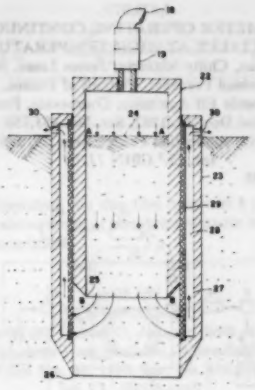
Int. Cl.³ G01N *15/08*

U.S. Cl. 73—38 6 Claims

3. Apparatus for measuring the air flow resistivity on the Earth's surface comprising:

means for subjecting a section of the Earth's surface to an air pressure;

means for venting to the atmosphere a cross-sectional area of a subterrain plane directly below said section of the Earth's surface; and



means for measuring the flow of air to said section to thereby obtain a measurement of the flow of air from said section of the Earth's surface to said subterrain plane.

4,478,070

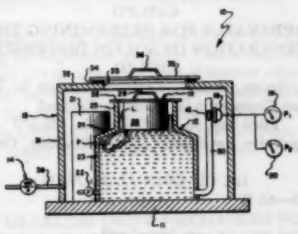
VACUUM PACKAGE TESTER AND METHOD

Earl W. Clifford, Getzville; John M. Perhach, Amherst, and Peter S. Sorce, Tonawanda, all of N.Y., assignors to The Aro Corporation, Bryan, Ohio

Filed Nov. 10, 1982, Ser. No. 440,566

Int. Cl.³ G01M *3/34*

U.S. Cl. 73—49.3 17 Claims



1. Apparatus for providing data by which the internal pressure of residual gas in a flexible-wall vacuum package exposed to a known external pressure may be calculated, comprising:

a container having a removable enclosure, said container being partially filled with a liquid;

a package-to-be-tested completely submerged in said liquid;

a vacuum pump operatively arranged to selectively reduced the pressure acting on the surface of said liquid;

a first indicator for indicating when the volume occupied by said package has increased by a first known volume;

a second indicator for indicating when the volume occupied by said package has increased by a second known volume; and

at least one pressure indicator operatively arranged to indicate the respective pressures acting on the surface of said liquid when the volume occupied by said package has increased by said first and second known volumes;

whereby the internal pressure of residual gas in said package when exposed to a known external pressure may be calcu-

lated as a function of said external pressure, said known volumes and said indicated pressures.

4,478,071

VISCOSIMETER OPERATING CONTINUOUSLY ESPECIALLY AT HIGH TEMPERATURE

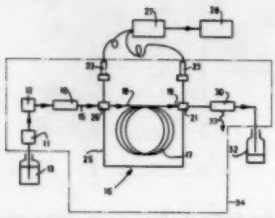
Didier Lecacheux, Chilly Mazarin; James Lesec, Saint-Leu-La Foret, and Roland Prechner, Pau, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Dec. 21, 1982, Ser. No. 451,750

Claims priority, application France, Dec. 29, 1981, 8124382

Int. Cl.³ G01N *11/04*

U.S. Cl. 073—55 **9 Claims**



1. Viscosimeter designed for continuous operation, comprising a measuring capillary in which the liquid phase whose viscosity is measured, undergoes a loss of pressure, the measuring capillary consisting of a tube having a length of several meters, wound around itself in the form of a helix having a diameter of at least 10 cm, the internal diameter of the said tube being substantially between 0.20 and 0.30 mm, and means of measuring the said loss of pressure said measuring means comprising two pressure sensors positioned at the entry and at the exit of the said capillary, for differential measurement of the loss of pressure in the capillary.

4,478,072

APPARATUS FOR DETERMINING THE CONCENTRATION OF SOLIDS DISPERSED IN A LIQUID

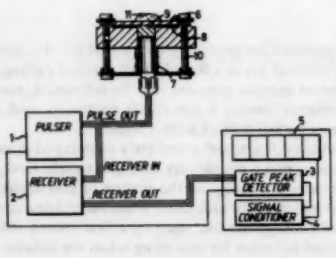
Harold T. Brown, Ruislip, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Sep. 30, 1982, Ser. No. 430,477

Claims priority, application United Kingdom, Oct. 9, 1981, 8130539

Int. Cl.³ G01N *15/06, 29/00*

U.S. Cl. 73—61 R **5 Claims**



1. Apparatus for the determination of the concentration of solid particles dispersed in a liquid medium which apparatus comprises in combination (a) an ultrasonic pulser, (b) an ultrasonic receiver, (c) a gated peak detector, (d) signal conditioning and display circuits and (e) an ultrasonic transducer assembly including a layer of known impedance far contacting the dispersion, the arrangement being such that in use the pulser produces an impulse which is converted by the transducer to an ultrasonic wave which is directed towards the layer and the dispersion and a second ultrasonic wave is reflected back by the interface between the layer and the dispersion to the ultrasonic receiver and passed to the gated peak detector which measures the peak amplitude of the echo from the layer dispersion interface, the peak amplitude then being converted by the signal conditioning and display circuits to produce a display of the peak amplitude, the solids content, or the peak amplitude and the solids content of the dispersion.

4,478,073

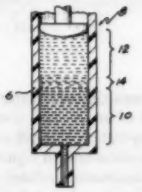
METHOD FOR DETERMINING PARTICLE SIZE AND/OR DISTRIBUTION

Richard M. Holsworth, Westlake, and Theodore Provder, Olmsted Falls, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jan. 25, 1983, Ser. No. 460,731

Int. Cl.³ G01N *15/04*

U.S. Cl. 73—61.4 **18 Claims**



1. A method for analysis of the size and/or distribution of particles emanating from a mother liquid by sedimentation in a rotating disc centrifuge which comprises the steps of forming externally of said disc a liquid spin medium containing at least two miscible liquids of different densities in substantially incompletely mixed condition whereby a density gradient is established within said spin medium, thereafter injecting said externally formed spin medium into said disc while spinning said disc at a predetermined speed, and followed by injecting a mother liquid containing particles the size and/or distribution of which are to be determined into said disc centrifuge while spinning at said predetermined speed and measuring by centrifugal sedimentation the partice size and/or distribution of the particles in said mother liquid.

4,478,074

AUTOMOTIVE AIR FLOW RATE METERING SYSTEM

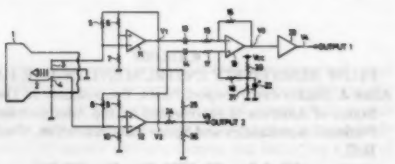
Shunichi Wada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1982, Ser. No. 406,835

Claims priority, application Japan, Aug. 11, 1981, 56/126970

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—118.2 **2 Claims**



1. An air flow measuring device for an internal combustion engine, comprising:

means (2) for generating vortices positioned within an intake air passage (1) of said combustion engine;

two heater wires (3, 4) positioned downstream of said vortex generating means;

two amplifying and biasing circuits (**11, 12**) connected separately to said heater wires for maintaining said heater wires at a constant temperature whereby a control voltage (V_1, V_2) is output from each of said two amplifying and biasing circuits;

differencing means (**19**) for obtaining a difference signal (V_3) of said two control voltages whereby the frequency of said difference signal measures the generation rate of said vortices and thereby the instantaneous air flow; and

summing means (**24, 25, 26**) for obtaining a sum signal (V_5) of said control voltages whereby said sum signal measures the average air flow.

4,478,075

AIR FLOW METER

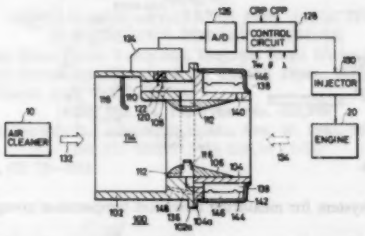
Yoshishige Oyama, Katsuta; Hiroshi Kuroiwa, Hitachi, and Yutaka Nishimura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,617

Claims priority, application Japan, Dec. 18, 1981, 56-203536

Int. Cl.³ G01F *5/00, 1/22*

U.S. Cl. 73—118.2 **14 Claims**



1. An air flow meter for an internal combustion engine comprising means forming a main passage for intake air provided between an air cleaner and said internal combustion engine, a venturi structure provided in said main passage, a by-pass passage formed with an inlet positioned in said main passage so as to permit a part of the air flowing in said main passage to enter the by-pass passage and having at the portion of said main passage which corresponds to the narrowest portion of said venturi structure an outlet from which the air flows out into said main passage, a flow rate detector provided in said by-pass passage to determine the flow rate of the air flowing therein, and compensating means connected to said by-pass passage between a first position located between said flow rate detector and said outlet of said by-pass passage and a second position on the downstream side of said venturi structure for controlling the flow rate of the air flowing from the inlet of said by-pass passage toward said flow rate detector during one portion of the cycle of said internal combustion engine in accordance with the flow rate of air flowing backward from said internal combustion engine toward said air cleaner during another portion of the cycle of said internal combustion engine.

4,478,076

FLOW SENSOR

Philip J. Bohrer, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,537

Int. Cl.³ G01F *1/68*

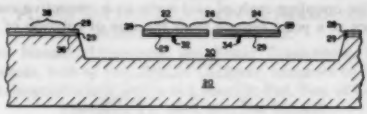
U.S. Cl. 73—204 **68 Claims**

1. A flow sensor, comprising:

a thin film heater suspended in air;

a pair of thin film heat sensors suspended in air and disposed on opposite sides of the heater;

and



means for operating the thin film heater at a constant temperature above ambient temperature under both flow and no-flow conditions.

4,478,077

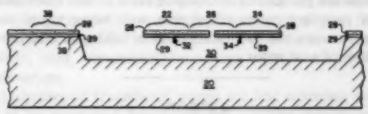
FLOW SENSOR

Philip J. Bohrer, and Robert G. Johnson, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,538

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **15 Claims**



1. A flow sensor, comprising:

a thin film heater;

a pair of thin film sensors;

a semiconductor body with a depression therein;

and

means connecting the heater and the sensors to the body and bridging the depression so that at least a major portion of the heater and the sensors are out of contact with the body and with the sensors disposed on opposite sides of the heater, the means connecting comprising two thin film members bridging the depression, each member comprising one sensor and a portion of the heater.

4,478,078

DIRECT GEARLESS DRIVE MECHANISM FOR AN INTERNAL GATE ROTARY VANE FLUID METER

Irwin A. Hicks, Radnor, and George W. Schneider, Jr., Huntingdon Valley, both of Pa., assignors to The Singer Company, Stamford, Conn.

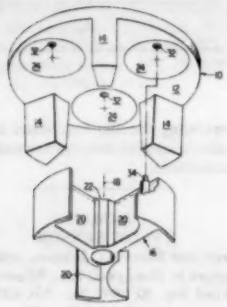
Filed May 5, 1983, Ser. No. 491,634

Int. Cl.³ G01F *3/08*

U.S. Cl. 73—253 **4 Claims**

1. In an internal gate rotary vane fluid meter, the combination of a rotor adapted to be mounted for rotation about an axis within said meter, said rotor having an end plate and a plurality of vanes fixed on the rotor end plate, a pocketed gate adapted to be mounted to rotate within the meter about an axis spaced from said rotor rotational axis, said gate having a periphery provided with a plurality of pockets therein for reception of the rotor vanes, the number of gate pockets being equal to the number of rotor vanes, said gate having a plurality of webs extending radially outward between adjacent pockets, a plurality of discs mounted for rotation on said rotor end plate each in a recess provided therefor, said discs being equally spaced angularly around the center line of the axis of rotation of the rotor at equal radii therefrom and with axes of rotation parallel

to the axis of rotation of the rotor, each of said discs having a rotational shaft and said rotor including a plurality of bearing means each adjacent one of said recesses for rotatably receiving respective ones of said disc shafts, each of said discs being substantially flush with the surface of said rotor end plate, and means for coupling each of said webs to a respective one of said discs at a point remote from the axis of rotation of said



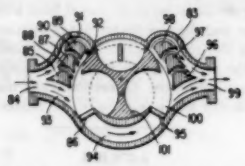
discs, said coupling means including a bushing in each of said discs and a pin fixedly attached to each of said webs and adapted to rotatably fit within a respective bushing, the distance between the axis of rotation of each of said discs and the point of coupling to its respective web being equal to the distance between the axis of rotation of said gate and the axis of rotation of said rotor.

4,478,079

INTERNAL GATE ROTARY VANE FLUID METER WITH CONTOURED INLET AND OUTLET PASSAGES

Irwin A. Hicks, Radnor, and David F. Kee, Glenside, both of Pa., assignors to The Singer Company, Stamford, Conn.

Filed May 13, 1983, Ser. No. 494,209
Int. Cl.³ G01F *3/08*
U.S. Cl. 73—253 **4 Claims**



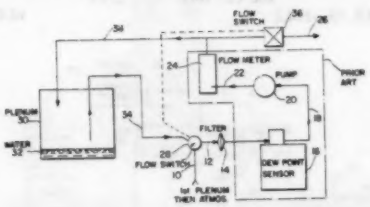
1. In a fluid meter, the combination of a body having an inlet passage and an outlet passage, a crescent shaped member within the body defining therewith an arcuate channel communicating at opposite ends with said passages, respectively, said body and said crescent also defining an offset circular cavity intersecting the channel between the inlet and outlet passages, a rotor mounted on the body for rotation about an axis within the arcuate channel and the offset cavity, said rotor having an end plate and at least three vanes fixed on the rotor end plate, said vanes being adapted to move by fluid pressure through said arcuate channel and through said portion of said cavity, a gate mounted on the body for rotation about an axis parallel to the rotor axis within said offset cavity, said gate having a periphery provided with pockets therein for reception of the rotor vanes, the number of gate pockets not exceeding the number of rotor vanes, said gate having webs extending radially outward from a central hub between adjacent pockets, means for coupling said rotor to said gate to synchronize the passage of rotor vanes through gate pockets without the vanes contacting the gate webs, said coupling means providing a drive train for gate rotation from the rotor, the outer diameter of said gate being the maximum possible which still allows the crescent to have an arc about the rotor axis which is sufficient to enclose the radial centerlines of any adjacent pair of rotor vanes, wherein said body is coupled to piping having a centerline and said inlet and outlet passages terminate at said piping on said centerline, said passages being curved from the respective one of the inlet and outlet so as to perpendicularly intersect the rotor vanes when the vanes are sealing against the respective ends of the crescent so as to seal the arcuate channel.

4,478,080

DEWPOINT MEASUREMENT SYSTEM FOR NEAR SATURATION CONDITIONS

Charles W. Bruce, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 28, 1983, Ser. No. 508,688
Int. Cl.³ G01N *25/66*
U.S. Cl. 73—335 **10 Claims**



1. A system for measuring dewpoint temperature comprising:

means for measuring the dewpoint temperature of air delivered to an inlet thereof;

plenum means for containing water therein and saturating the air contained therein while at ambient temperature;

first flow switching means connected in a first position thereof between the plenum means and the measuring means for directing the saturated air to the measuring means for determining the dewpoint thereof; and

ambient air inlet means connected to a second position of the flow switching means for selectively directing ambient air to the measuring means for determining the dewpoint thereof;

wherein determination of the dewpoint temperatures of the ambient and saturated air are determinative of the relative humidity of the ambient air.

4,478,081

WHEEL ADAPTERS FOR TRUING AND BALANCING TIRES

Aubrey E. Greene, Ellaville, Ga., assignor to Amermac Inc., Ellaville, Ga.

Filed Oct. 21, 1982, Ser. No. 435,853
Int. Cl.³ G01M *1/06*
U.S. Cl. 73—487 **8 Claims**

1. An assembly for truing and/or balancing a tire comprising:

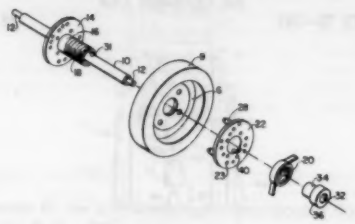
a backing plate including an integral, centrally located tubular extension extending from said backing plate in axial alignment therewith,

an adapter that fits over said tubular extension coaxial therewith,

said adapter including a set pattern of apertures therein,

said set pattern of apertures in said adapter plate is formed with the apertures equi-angularly spaced relative to each other with their centers being on the circumference of a

circle with the center of the circle coinciding with the axis of said adapter plate with apertures on circles of increased radius angularly spaced from an adjacent circle of apertures of lesser radius,



spacer means separating said adapter from said backing plate,

and means for securing said adapter on said tubular extension of said backing plate.

4,478,082

METHOD AND APPARATUS FOR DETECTING RUBBING IN A ROTARY MACHINE

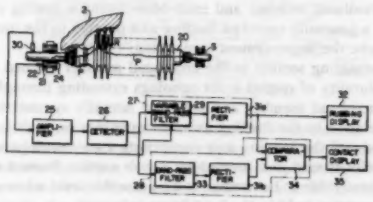
Ichiya Sato; Takao Yoneyama; Tsuguaki Koga; Kazuo Ikeuchi, and Katsukuni Hisano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1982, Ser. No. 408,949

Claims priority, application Japan, Aug. 26, 1981, 56-132799

Int. Cl.³ G01H *1/00*; G01M *13/00*

U.S. Cl. 73—593 **4 Claims**



1. An apparatus for detecting the occurrence of rubbing in a rotary machine, comprising a rotary machine, at least one acoustic sensor installed on at least one of the rotor part and the stator part of the rotary machine for sensing an acoustic signal generated due to the occurrence of rubbing in the rotary machine, detector means for detecting the output signal from said acoustic sensor, means for fetching a frequency component having a frequency substantially equal to the rotation frequency of the rotary machine from the output signal from said detector means, display means for displaying the output signal from said fetching means, and abnormal metal-to-metal contact detecting means for detecting the occurrence of abnormal metal-to-metal contact at said bearing, said display means including a rubbing display unit displaying the output signal from said rubbing detecting means and an abnormal metal-to-metal contact display unit displaying the output signal from said abnormal metal-to-metal contact detecting means, wherein said rubbing detecting means includes a variable band-pass filter circuit fetching said frequency component from the output signal from said detector means and a first rectifier circuit rectifying the output signal from said variable band-pass filter circuit, and said abnormal metal-to-metal contact detecting means includes a low-frequency band-pass filter circuit receiving the output signal from said detector means, a second rectifier circuit rectifying the output signal from said band-pass filter circuit, and a comparator circuit comparing the output signals from said first and second rectifier circuits.

4,478,083

PLANE RECONSTRUCTION ULTRASOUND TOMOGRAPHY DEVICE

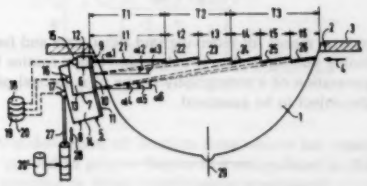
Dieter Hassler, Uttenreuth, and Elmar Trautenberg, Fuerth-Stadeln, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,437

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224453

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—620 **13 Claims**



1. An ultrasound tomography device having an ultrasound transmitting/receiving system for line scanning of an object to be examined from different angular directions about an axis of rotation, said transmitting/receiving system comprising, in combination:

(a) ultrasound transducer means for line scanning an object to be examined from different angular directions about said axis of rotation and at different tiliting angles with respect to a coronal-plane of said object to be examined;

(b) adjustable forcusing means, associated with said transducer means, for focusing said transducer means at various object depths in coronal-like scanning planes;

(c) adjustable positioning means, asociated with said transducer means, for adjusting the tilting angles of the respective transmitting/receiving lobes of said transducer means; and

(d) time gate circuit means, coupled to said transducer means, for acquiring signal data received by said transducer means from different depths in successive time periods in coordination with the tilting angle of said transducer means,

whereby said focusing depths, said tilting angles and said time gated signal acquisition are controlled to provide a coronal like scanning plane of the object to be examined.

4,478,084

ULTRASOUND TOMOGRAPHY DEVICE

Dieter Hassler, Uttenreuth, and Elmar Trautenberg, Fuerth-Stadeln, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,438

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224412

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—620 **8 Claims**

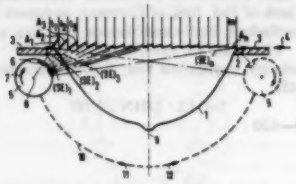
1. An ultrasound tomography device for line scanning an object to be examined from different angular directions which comprises in combination:

a sagittal scanner having an ultrasound converter and being rotatably mounted so that the direction of said ultrasound converter results in a fan-like expanding transmitting-/receiving direction which allows the acquisition of numerous line scan views of the object to be examined along the different ultrasound directions;

translational means for moving said sagittal scanner about

said object to be examined; said translational means being operative as to not interfere with said rotatability of said sagittal scanner;

a time gate circuit for acquiring section by section signal data, during successive time intervals, from said ultrasound converter; and



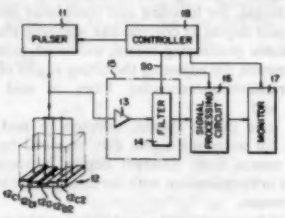
computer means for receiving said signal data and for combining said signal data in a data conversion routine for the generation of a tomography image of a coronal plane of the object to be examined.

4,478,085

ULTRASOUND DIAGNOSIS APPARATUS

Hiroshi Sasaki, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 16, 1982, Ser. No. 408,276
Claims priority, application Japan, Aug. 18, 1981, 56-129529
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—625 **5 Claims**



1. An ultrasonic diagnosis apparatus comprising:

transducer means, comprising a linear array of transducer elements sequentially disposed in a direction for directing pulses of ultrasonic energy in the form of a beam into an object and receiving echoes of said pulses to convert said echoes to electrical signals, the thickness of said transducer elements increasing from transducer elements at a central portion of said array to transducer elements toward both edges in said direction, the frequency of said ultrasonic energy radiated by each of said transducer elements being inversely related to the thickness of each of said transducer elements;

means for energizing said transducer; and

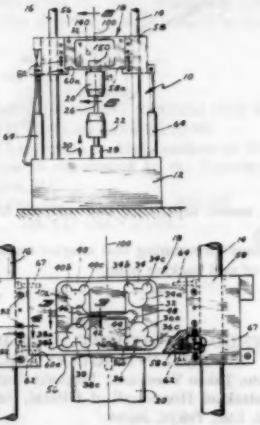
filter means for selectively filtering said electrical signals to pass frequency components of said electrical signals associated with selected frequencies of said ultrasonic energy and not pass other frequency components of said electrical signals, the arrangement of said elements of said transducer means and said filter means cooperating to cause the width of said ultrasonic beam at the outlet of said transducer means to vary with the selected frequency components of said electrical signals passed by said filter means.

4,478,086

LOAD FRAME CROSSHEAD CONSTRUCTION

Martin M. Gram, St. Louis Park, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jan. 7, 1983, Ser. No. 456,504
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—781 **18 Claims**



1. A load frame crosshead member for use with a load frame including a base, at least two upright support columns extending from the base for supporting the crosshead member and first and second means for retaining a test specimen between the crosshead member and such base during a testing cycle along a generally centered loading axis parallel to the upright supports, the improvement comprising:

a measuring section in the crosshead member defined by a plurality of spaced apart openings extending through the crosshead member and arranged laterally symmetrically relative to the loading axis, the openings on each lateral side of the loading axis comprising two openings vertically spaced and formed by a web section formed sufficiently thin to be stressed to a measurable level when a test specimen held in the load frame is loaded;

means for measuring stress positioned on the measuring webs; and

clamping means located at each end of the crosshead member for clamping the crosshead to the upright supports.

4,478,087

KÁRMÁN'S VORTEX STREET FLOW METER

Yoshiaki Asayama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

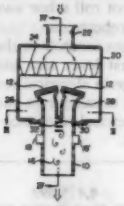
Filed Sep. 20, 1982, Ser. No. 420,295
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.22 **10 Claims**

1. A Kármán's vortex street flow meter comprising:

a conduit means, the upstream end of said conduit means being a pair of upstream conduits having the upstream ends spaced from each other laterally of the conduit means for receiving a fluid to be measured thereinto, the downstream end of said conduit means being a single downstream conduit into which said upstream conduits merge, the walls of said upstream conduits forming a vortex generating portion between said upstream conduits at the junction where said upstream conduits merge into said single downstream conduit, and

a detector in said single downstream conduit and spaced downstream of said vortex generating portion for detect-

ing the frequency at which vortices of a Kármán's vortex street are generated downstream of said vortex generating



portion for use in determining the flow speed or flow rate of the fluid.

4,478,088

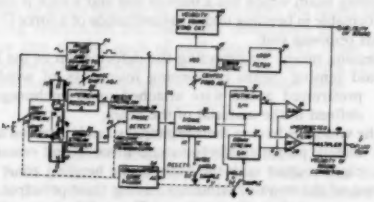
FLOWMETER SYSTEM WITH ULTRASONIC ENERGY IMPROVEMENT IN EQUILIBRATION

Robert S. Loveland, West Covina, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 224,785, Jan. 13, 1981, abandoned. This application Dec. 21, 1982, Ser. No. 451,910

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.28 **8 Claims**



1. A flowmeter system comprising, in combination,

transducer means for transmitting acoustic compression waves upstream for a selected time period and downstream for a selected time period in a fluid flowing in a path; the transmission of said upstream and downstream compression waves occurs immediately following one another

circuit means for measuring the phase difference between the transducer means in the fluid flow path of the acoustic compression waves transmitted upstream the measurement of said phase difference occurring during the transmission of said upstream compression waves but only near the end of said time period and circuit means for measuring the phase difference between said transducer means in the fluid flow path of the acoustic compression waves transmitted downstream the measurement of said phase difference occurring during the transmission of said upstream compression waves but only near the end of said time period;

the measurement of said phase differences occurring near the end of the time period so that the acoustic energy of the transmitted compression waves is allowed to equilibrate,

circuit means for producing a difference signal dependent on the difference between the two phase differences, the magnitude and sign of which being directly related to the instantaneous fluid flow rate and its direction; and

circuit means for automatically adjusting the frequency of the acoustic compression waves to a frequency where a fixed wavelength distance, in the fluid flow medium, occurs across the path of the transducer means.

4,478,089

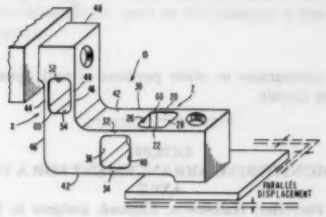
TRI-AXIAL FORCE TRANSDUCER FOR A MANIPULATOR GRIPPER

Henry E. Aviles, Pompano Beach; Jane A. Gregory; Hugo A. Panissidi, both of Boca Raton, and Henry E. Wattenbarger, Lake Worth, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1982, Ser. No. 393,259

Int. Cl.³ G01L *5/16*

U.S. Cl. 73—862.04 **11 Claims**



1. A multi-degree of freedom force sensor for measuring forces applied to gripper fingers in a manipulator or the like when grasping an object therebetween comprising:

a pair of force sensor units each rigidly connected at a first end to a respective finger and at a second end to a drive member for the gripper fingers;

a plurality of parallel beam structures contained in each of said force sensor units, each parallel beam structure comprising a pair of spaced parallel flexure members, a gap, and end walls defining said gap, each of said pair of spaced parallel flexure members bridging said gap between said end walls in each of said parallel beam structures and oriented so that the axes perpendicular to the parallel planes of the parallel flexure members are orthogonal to one another;

a radiused surface section located at both ends and on the facing surfaces of said parallel flexure members where they join said walls in said parallel beam structures of said force sensor units to move the maximum flexure points away from said walls and extend them over a wider area thereby lessening material flexure fatigue; and

a plurality of electric circuits, two pairs of strain gages connected in each of said electric circuits with each gage of each pair located at a predetermined opposite maximum flexure point on the surface of each flexure member opposite from the radiused surface section of each flexure member of said parallel beam structures so as to measure the flexure of the flexure member at the predetermined flexure points, which flexure is indicative of the force vector along the axis perpendicular to said parallel flexure members.

4,478,090

DYNAMOMETER CONTROLLERS

Robert A. McFarland, 640 Survale, Ventura, Calif. 93003

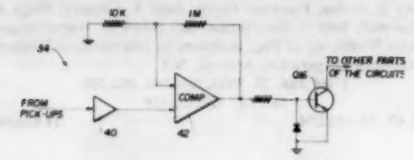
Filed May 17, 1982, Ser. No. 378,817

Int. Cl.³ G01L *3/016*

U.S. Cl. 73—862.09 **13 Claims**

1. A controller circuit for a dynamometers comprising a plurality of pick-ups, said circuit comprising noise suppression means between each pick-up and other portions of the circuit, said noise suppression means comprising a voltage comparator, means to feed a signal from each said pick-up to said voltage comparator as one of the input signals to said voltage comparator, a hysterisis feedback loop to cause the output of said volt-

age comparator to be another input to said voltage comparator, and a transistor buffer to output the output signal of said



voltage comparator to other portions of said dynamometer controller circuit.

4,478,091

LOAD MONITORING ARRANGEMENT FOR A VEHICLE AXLE

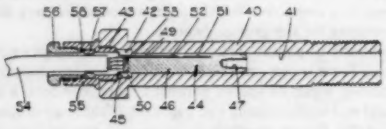
John S. Forrester, Halesowen, England, assignor to Lucas Industries, Birmingham, England

Filed Aug. 11, 1982, Ser. No. 407,174

Claims priority, application United Kingdom, Aug. 18, 1981, 8125120; Mar. 27, 1982, 8209083

Int. Cl.³ G01L 5/00

U.S. Cl. 73—862.54 9 Claims



1. A load monitoring arrangement for a vehicle axle comprising a bolt which in use is fixedly mounted on a vehicle body and serves to connect said vehicle body with a resilient suspension part, wherein said bolt has a hollow therein, an insert disposed in the hollow of said bolt so as to be in intimate contact with said bolt, and a transducer provided on said insert so as to monitor the effect of loading forces acting on said bolt, said transducer being disposed within said bolt.

4,478,092

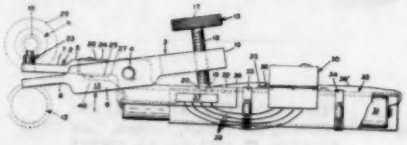
TEXTILE ROLL-WEIGHT GAUGE

Jess W. Oren, III, Washington Boro, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Feb. 22, 1983, Ser. No. 468,857

Int. Cl.³ G01L 5/00

U.S. Cl. 73—862.55 6 Claims



1. A gauge for measuring the weighting force on a textile cot roll comprising:

(a) first and second pivoted levers mounted on a transverse pivot stud, said levers having shaped body portions extending forwardly and rearwardly of said pivot, said forwardly extending portions of said levers having end portions adapted to be inserted in an opening between a movably mounted cot roll arbor and a fixed drive roll therefor;

(b) means for moving the levers about the pivot stud to separate the forwardly extending body portions of said levers to lift the cot roll arbor away from the drive roll when inserted therebetween;

(c) strain gauge means secured to the forwardly extending portion of said first lever and adapted to sense flexure thereof as a change in electrical resistance; and

(d) means connected to said strain gauge means for translating changes in electrical resistance to weighting force on the textile cot roll.

4,478,093

DYNAMOMETER HAVING A BENDING BEAM

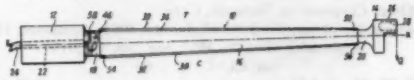
Jean-Claude Valadier, Paris, France, assignor to Testut Aequitas, Paris, France

Filed Mar. 7, 1983, Ser. No. 472,447

Claims priority, application France, Mar. 9, 1982, 82 03920

Int. Cl.³ G01L 1/22; H01C 10/10

U.S. Cl. 73—862.65 15 Claims



1. A dynamometer comprising a testing member having a bending beam which has a built-in end and which is elastically deformable in bending under the unfluence of a force Q applied to its opposite end;

sensing means for detecting the deformation of the beam;

said sensing means comprising four rows of windings of prestressed gauge wire attached upon anchorage zones defined in the material of the beam;

the windings having their principal strands directed approximately perpendicularly to said force Q and remaining in close contact with the beam in the bending zone;

two of the rows of windings having their principal strands arranged along the tensioned fibres of the beam, the other two rows of windings having their principal strands arranged along the compressed fibres of the beam;

the four rows of windings forming an electrical bridge assembly.

4,478,094

LIQUID SAMPLE HANDLING SYSTEM

Kari Salomaa, Jenner; Roy Merrill, Orinda; Richard Leath, El Cerrito; Timothy Wennberg, and Joseph Widunas, both of San Francisco, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 459,973, Jan. 21, 1983, abandoned. This application May 5, 1983, Ser. No. 489,866

Int. Cl.³ G01N 35/06

U.S. Cl. 73—863.32 25 Claims

1. A machine for automatically transferring at least a portion of liquid sample from one or more liquid-containing receptacles to one or more other receptacles, comprising:

a head assembly translatable between upper and lower positions along a vertical axis;

means for moving said head assembly along said vertical axis;

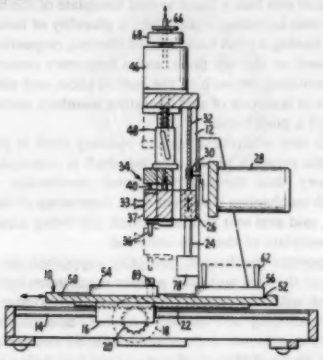
a plunger assembly mounted on said head assembly for movement therewith, said plunger assembly including a row of pipettes having depending ends for receiving tips, a row of plungers respectively disposed within said pipettes, and means for moving said plungers within said pipettes to vary their internal volumes;

tip ejector means mounted on said head assembly for removing tips disposed on said depending ends of said pipettes;

a table mounted beneath said head for translation along a

horizontal axis, said table having work stations spaced along said axis for respectively accommodating a tray having pipette tip-receiving receptacles and one or more trays providing said liquid-containing receptacles and other receptacles;

means for moving said table along said horizontal axis to place any selected one of the receptacles in registry with said pipettes; and



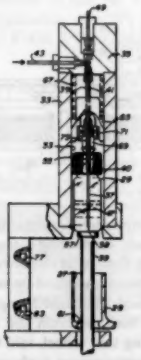
means for controlling each of said moving means for said head assembly, plungers and table and said tip ejector means to effect transfer of liquid between the liquid-containing receptacles and the other receptacles and to replace tips on the ends of said pipettes with other tips disposed in at least some of the pipette tip-receiving receptacles between predetermined liquid transfer steps.

4,478,095

AUTOSAMPLER MECHANISM

Martin P. T. Bradley, Cupertino; Leslie A. Miller, San Jose; Thomas J. McCall, Fremont, and Duane L. Middlebusher, San Jose, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 9, 1981, Ser. No. 241,810
Int. Cl.³ G01N *35/04, 35/06*
U.S. Cl. 73—864.21 **13 Claims**



13. A method of withdrawing a fluid sample from a sample vial of the kind which has a septum sealing one end of the vial, said method comprising,

piercing the septum with a first needle and inserting the first needle within the body of the fluid sample within the vial,

piercing the septum with a second needle which has an inner diameter larger than the outer diameter of the first needle so as to provide a passageway between the first and second needles,

pressurizing the sample within the vial by supplying pressurized fluid through said passageway between the needles,

connecting a first conduit to the interior of the first needle,

withdrawing a positively-controlled amount of the sample under pressure in the vial by exerting a controlled suction on the first conduit, and

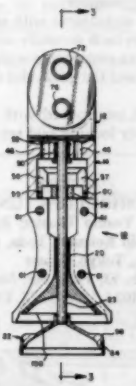
blocking the flow of the fluid sample back to the sample vial while injecting the sample from the first conduit into a sample-using device, such as, for example, a liquid chromatograph.

4,478,096

SHIELDED SNIFFING DEVICE

Wolfgang K. Heiland, Trevose, and Paul Magidman, Warrington, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 509,091
Int. Cl.³ G01N *1/24*
U.S. Cl. 73—864.73 **1 Claim**



1. A device for detecting contraband in closed luggage comprising

(a) a handle provided with a bore and having two ports, each of which is connected to a passageway providing access to said bore;

(b) a body, the upper part of which fits into the bore in the handle, said body being provided with a bore, a multitude of axial holes to allow passage of gas through the body, and an orifice, said orifice providing access from the bore to one of the passageways in the handle;

(c) a spool valve movably located in the bore of the body and having two sets of radial holes for alignment with the orifice in the body when the spool valve is in either of two positions and two orifices, each orifice providing a passageway to one of the two sets of radial holes; and

(d) a lower section consisting essentially of two half heads, a shield air guide and bearing and a nozzle with an extension tube, said lower section being threaded on to the body and said nozzle and extension tube being provided with means for moving axially within the lower section and the body.

4,478,097
PUSHBUTTON TUNER

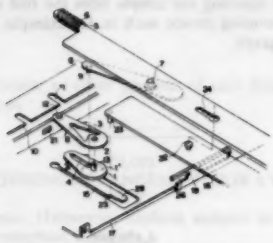
Yoshio Tanaka, Saitama, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 233,939

Claims priority, application Japan, Feb. 15, 1980, 55-17135[U]; Mar. 6, 1980, 55-27326

Int. Cl.³ H03J *5/12*; G05G *1/02*

U.S. Cl. 74—10.33 **7 Claims**



1. A pushbutton tuner comprising:

button slide members each provided with a push button;

memory slides each adapted to be set in a position corresponding to a desired tuning frequency by a manual tuning operation;

setting members each having a guide slot;

a chassis having openings each for rotatably receiving the respective setting member;

link members each engageable with said memory slide;

setting arm members each pivotally connected to the respective button slide an engageable with the guide opening of the link member and the guide slot of the setting member; and

slide members each interlocked with the respective button slide for releasably locking said setting member.

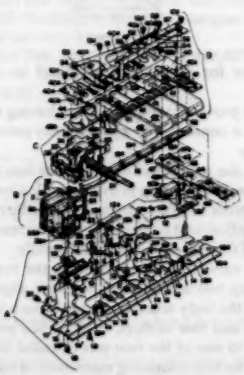
4,478,098
PUSHBUTTON TUNER

Yasuhisa Nishikawa; Yoshio Tanaka; Ryoichi Hasumi, all of Saitama, and Takashi Koizumi, Toda, all of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,639

Int. Cl.³ H03J *1/00, 5/12*; F16D *27/10*

U.S. Cl. 74—10.33 **10 Claims**



1. A pushbutton tuner comprising;

a base unit including a baseplate, a plurality of operating members each pivotally supported on the baseplate, and memory slide disposed over the baseplate so as to be displaced by the operating members;

a coil unit including a plurality of tuning coils, a plurality of cores provided in relation to the corresponding tuning coils, respectively, and a moving member responsive to the displacement of the memory slide for inserting and drawing the cores into and out of the corresponding coils, said coil unit being fitted to said baseplate of the base unit;

an arm unit including a top plate, a plurality of button slides each having a push button fitted thereto, respectively, and disposed on the top plate, and a frequency control member provided on each of the button slides and adapted to act on at least one of said operating members upon depression of a push button;

a clutch unit wherein a manual rotating shaft is provided, and the rotation of the rotating shaft is conveyed to the memory slide through the clutch mechanism and the clutch mechanism is opened upon depressing of the button slide, said arm unit and said clutch unit being arranged on the baseplate of the base unit; and

a dial pointer mechanism pivotally supported on the top plate of the arm unit, said pointer mechanism being interlocked with the memory slide, said dial pointer mechanism including a T-shaped member, control rods connected to opposite ends of the T-shaped member, respectively, one end of each of said control rods being pivotally connected to the top plate, and one of said rods being interlocked with the memory slide.

4,478,099
DRIVING GEAR

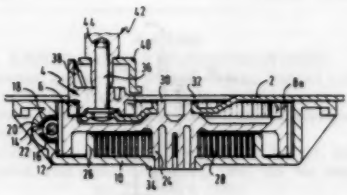
Peter Hess, Coburg; Gunter Mühling, Grub a. Forst, and Gerhard Schust, Weidhausen, all of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co.

Filed Dec. 23, 1980, Ser. No. 219,944

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1980, 3000199

Int. Cl.³ F16H *37/00*

U.S. Cl. 74—11 **17 Claims**



1. Driving gear comprising a supporting plate, a wheel rotatably mounted on said supporting plate, said wheel having a rim thereon with teeth formed in the inwardly facing surface of said rim, a drivable pinion mounted on said supporting plate with said pinion disposed in meshed engagement with said teeth formed in said wheel, wherein the improvement comprises a housing enclosing said wheel, said housing attached to said supporting plate, entrainment surfaces on the outer circumferential periphery of said wheel spaced closely inwardly from said housing, and an elongated power take-off member extending into said housing and disposed within said housing in engagement with said entrainment surfaces with said power take-off member supported against said housing opposite the location where said power take-off member is in engagment with said entrainment surfaces.

4,478,100

AUTOMATIC TRANSMISSION

Albert P. Sfredda, 2106 Iris Pl., Bethlehem, Pa. 18018

Filed Mar. 8, 1982, Ser. No. 355,353
Int. Cl.³ F16H *13/02, 13/10, 1/28*
U.S. Cl. 74—206 8 Claims

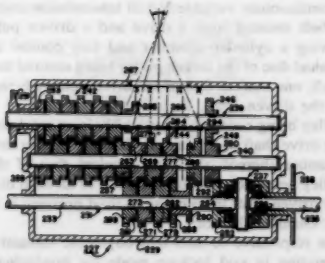
1. An automatic transmission comprising; a housing fixedly supporting an annular raceway, a wheel having inner concentric raceway means, said wheel disposed within said annular raceway and having rolling contact therewith, a drive shaft disposed concentrically to said annular raceway and rotatably supported by said housing, a radially moveable drive member connected to said drive shaft and engaging the inner raceway means of said wheel, means for maintaining the engagement between said drive member and said inner raceway means upon rotation of said drive member, whereby rotation of said drive shaft will cause said drive member to impart radial driving impulses to the inner raceway means of said wheel, roller means supported for planetary rotation about the axis of said drive shaft, said roller means engaging the inner raceway means of said wheel, means for maintaining the engagement between said roller means and said inner raceway means, an output shaft axially aligned with said drive shaft and rotatably supported by said housing, coupling means for connecting said wheel to said output shaft, whereby the wheel torque is transmitted to said output shaft by the coupling means.

4,478,101

MECHANICAL TRANSMISSION APPARATUS

Antanas J. Rumsa, 3142 W. 42nd Pl., Chicago, Ill. 60632

Continuation of Ser. No. 174,083, Jul. 31, 1980, abandoned, which is a continuation of Ser. No. 875,962, Feb. 8, 1978, abandoned. This application Apr. 29, 1983, Ser. No. 489,720
Int. Cl.³ F16H *3/08, 1/06, 1/12, 3/22*
U.S. Cl. 74—325 7 Claims



1. Mechanical transmission apparatus for coupling drivingly a source of mechanical power to a load, comprising:

a housing;

first and second shaft means mounted in said housing;

a gear train including a plurality of gears mounted on said first and second shaft means, said gear train including a first set of axially aligned gears arranged in pairs of fixedly connected together gears, and a second set of axially aligned gears arranged in pairs of fixedly connected together gears, each pair of said first set of gears intermeshing with corresponding pairs of said second set of axially aligned gears to form a gear train, one of said pairs of gears being freely rotatable on said first shaft means, each one of the pairs of gears including a large gear and a small gear, each one of said large gears having substantially the same number of teeth and each one of said small gears having substantially the same number of teeth, certain ones of said gears on one of said shaft means being adapted to serve as speed shift gears;

means for coupling the source of power to one of said pairs of gears of said gear train;

means for coupling power drivingly to the load; and

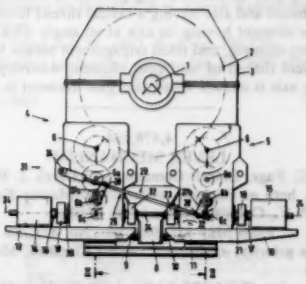
a single shifting member movably mounted directly on one of said first and second shaft means for conveying power selectively from the source of power via said gear train through a selected one of said speed shift gears of said gear train to one of said shaft means to cause it to be driven at a selected one of a plurality of speeds and thus to cause the load to be driven at a selected one of a plurality of speeds, whereby power is transmitted from the source through said gear train to the load.

4,478,102

TILT DRIVE FOR METALLURGICAL VESSELS

Wilhelm Ackermann, Essen, and Karlheinz Langlitz, Mulheim, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,741
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115821
Int. Cl.³ F16H *57/00, 55/18, 37/06*; C21C *5/50*
U.S. Cl. 74—410 4 Claims



1. A torque-equalizing and locking mechanism for pinion gears for a tilt drive for a metallurgical vessel, wherein said tilt drive comprises:

(a) a large sprocket gear, non-rotatively mounted to the rocker pin of a metallurgical vessel, said sprocket gear being housed in a casing;

(b) at least two pinion gears for rotating said sprocket gear, rocker pin and vessel;

(c) a separate reduction gear mechanism for driving each of said pinion gears;

(d) said reduction gear mechanisms comprising at least one reduction gear rotatable about a shaft; and

(e) a separate drive motor for selectively driving each of said reduction gear mechansims; wherein said torque-equalizing and pinon gear locking mechanism comprises:

(f) a lever arm having two ends, one end of which is rotatably secured to each of said shafts;

(g) said lever arms being of adjustable effective length;

(h) a torque-equalizer bar connecting the other ends of a pair

of said lever arms, said bar being pivotable about said other ends of said lever arms;

(i) said bar serving to transmit and thereby equalize torque between said paired levers connected to the shafts of said reduction gear mechanisms; and

(j) said bar being further provided with a locking mechanism for pinion gears, comprising a longitudinal extension of said bar as a piston and a cylinder secured to said casing, said piston and cylinder acting as a straight sliding mechanism.

4,478,103

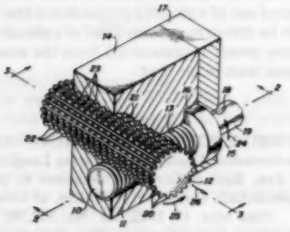
WORM GEAR MECHANISM

James M. Benjamin, Indianapolis, Ind., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 22, 1981, Ser. No. 266,442

Int. Cl.³ F16H *1/16, 1/20, 1/18, 27/02*

U.S. Cl. 74—425 **15 Claims**



1. A worm and worm gear mechanism comprising a worm element fixedly mounted along and rotatable about its longitudinal axis, said worm element having a helical thread formed thereon, a gear element having gear teeth meshing with said helical thread and also having a helical thread formed thereon, said gear element having its axis at an angle with said axis of said worm element, and fixed engagement means for engaging said helical thread of said gear element whereby movement along its axis is caused when said gear element is rotated.

4,478,104

LEVER MECHANISM

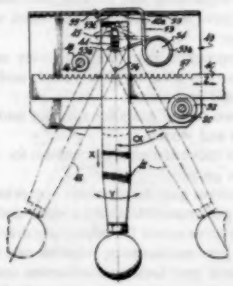
Ronald C. Page, Balsall Common, and Derek J. Smith, Curdworth, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 11, 1982, Ser. No. 377,215

Claims priority, application United Kingdom, May 14, 1981, 8114766

Int. Cl.³ G05G *11/00, 1/00;* **F16H** *21/44*

U.S. Cl. 74—479 **6 Claims**



1. A lever mechanism including an operating member, a support relative to which said operating member is displaceable, a lever pivotally mounted on the support about a pivot axis which is also translationally moveable, a pin on the lever, a rack on the operating member, and a bias means acting to translationally move the lever on its axis away from the rack to hold the pin and rack disengaged when the lever is released, the operating member being displaceable in a given direction relative to the support by translational movement of the lever on its moveable axis against the bias to bring the pin and rack into engagement followed by pivotting of the lever relative to the support with the pin and rack engaged.

4,478,105

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE V-BELT TRANSMISSION WITH HYDRODYNAMIC TRANSMISSION UNIT

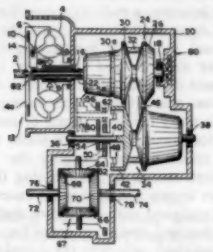
Sigeaki Yamamuro, Zushi; Hiroyuki Hirano; Yoshiro Morimoto, both of Yokosuka, and Yoshikazu Tanaka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 26, 1982, Ser. No. 362,487

Claims priority, application Japan, Mar. 28, 1981, 56-44748; Mar. 28, 1981, 56-44750

Int. Cl.³ F16H *47/00, 37/00;* **F16D** *35/00, 21/04*

U.S. Cl. 74—730 **14 Claims**



1. A continuously variable V-belt transmission comprising:

a continuously variable V-belt transmission unit having a drive shaft and a driven shaft;

a hydrodynamic transmission unit having a pump impeller and a turbine runner drivingly connected to the drive shaft of the continuously variable V-belt transmission unit, said hydrodynamic transmission unit having a lock-up mode of operation in which said hydrodynamic transmission is locked;

the continuously variable V-belt transmission unit having a V-belt running over a drive and a driven pulley, each having a cylinder chamber and two conical discs, one conical disc of the driven pulley being secured to the drive shaft, one conical disc of the driven pulley being secured to the driven shaft, the other conical disc of the drive pulley being controllably movably in an axial direction of the drive shaft in response to fluid pressure in the cylinder chamber thereof, the other conical disc of the driven pulley being controllably movable in an axial direction of the driven shaft in response to fluid pressure in the cylinder chamber thereof;

means responsive to said hydrodynamic transmission unit operating in said lock-up mode for producing a signal indicative of the hydrodynamic transmission unit being in said lock-up mode of operation;

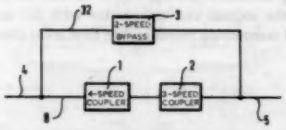
pumping means for pumping fluid; and

line pressure regulator valve means for regulating the fluid supplied by said pumping means in response to said signal to provide a line pressure which varies in response to the hydrodynamic transmission unit operating in said lock-up mode.

4,478,106
MULTI-GEAR TRANSMISSION SYSTEM SHIFTABLE UNDER LOAD

Friedrich Schreiner, Kehlen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,976
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024862
Int. Cl.³ F16H *37/00, 3/02, 57/10*
U.S. Cl. 74—740 **8 Claims**



1. A gear-shifting mechanism enabling the establishment of a multiplicity of different speed ratios between an input shaft and an output shaft, comprising:

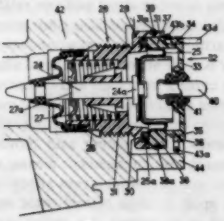
a first power train connecting said input shaft with said output shaft and including two cascaded ratio-changing couplers, one of said couplers being shiftable amoung m different speed ratios, the other of said couplers being shiftable amoung n different speed ratios enabling the selective establishment of n groups of m speed ratios each for a total of m.n different overall speed ratios; and

a second power train bypassing said cascaded couplers, said second power train including a further coupler having at least two selectively effective speed ratios which is normally disengaged and is engageable to interconnect said shafts during simultaneous deactivation of said cascaded couplers, preparatorily to a shifting between two adjoining groups of m speed ratios, to establish an intermediate speed ratio lying between the two closest overall speed ratios of said adjoining groups.

4,478,107
SUCTION CAP FOR AN AUTOMATIC GEARBOX

Michel Buannec, Villejuif, France, assignor to Regie Nationale des Usines Renault

Continuation of Ser. No. 79,922, Sep. 28, 1979, abandoned. This application Oct. 13, 1981, Ser. No. 310,831
Claims priority, application France, Oct. 12, 1978, 78 29190
Int. Cl.³ B60K *23/00;* **F01B** *9/02*
U.S. Cl. 74—863 **9 Claims**



7. A suction cap for the control of pressure regulation in an automatic gearbox for an engine having an intake manifold where suction is developed, comprising:

a housing with a cover member, said housing being generally cylindrical and having a radially inwardly extending portion and having an intermediate chamber,

a diaphragm having a peripheral part retained by said cover member on said housing and defining with said cover member a suction chamber connectable to the intake manifold,

a push-rod having one end secured to said diaphragm and extending into said intermediate chamber of said housing, which is separated from said suction chamber by said diaphragm and communicates with atmosphere,

a spring in said intermediate chamber, resting on said radially inwardly extending portion of said housing and being operatively connected between the push-rod and said radially extending portion, said spring acting on the push-rod in a direction opposite to that of the suction in the suction chamber,

a sealing bellows retained at one end by said housing and at the other end by said push-rod for defining said intermediate chamber along with said housing and said diaphragm,

the outer surface of said housing being threaded for mounting the cap in the gearbox and for adjusting the cap by rotation,

means for maintaining the housing in any required adjustment position,

an outer part of the housing extending axially in regularly spaced claws forming an inner cylinder,

said cover comprising a cylindrical part which penetrates into said inner cylinder and has axial outer corrugations with regularly spaced portions located between the said claws,

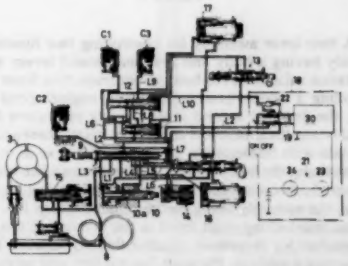
a retaining ring housed in a mating outer circumferential groove provided in the said claws and said corrugations and securing said cover to said housing,

the peripheral part of said diaphragm being kept pressed on the housing by means of the said cylindrical part of the cover.

4,478,108
CONTROL APPARATUS FOR OIL PRESSURE OPERATED TYPE TRANSMISSION FOR VEHICLE

Sadanori Nishimura, and Masakazu Maezono, both of Omiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,220
Claims priority, application Japan, Jul. 17, 1981, 56-110866
Int. Cl.³ B60K *41/08*
U.S. Cl. 74—866 **5 Claims**



1. A control apparatus for a vehicle of the type having an oil pressure source, an engine and a transmission having at least two transmission trains including a high speed transmission train and a low speed transmission train, said low speed transmission train including a one-way clutch means wherein said low speed, transmission train is selectively disengaged during the operation of said high speed transmission train, each of said transmission trains having an oil pressure operated clutch means therein, said control apparatus comprising creep-preventing hydraulic circuit means having a first passage connecting the source and the low speed clutch means, a second passage connecting the source and the high speed clutch means, a shift valve for opening and closing the second passage in accordance with the vehicle speed, a third passage connecting

the source and the shift valve, and a control valve for opening the third passage under an engine idling condition at the time the vehicle stops, so that the source is selectively coupled to said high and low speed clutch means and the creep-preventing hydraulic circuit means for operating said high speed clutch means in response to the idling of the vehicle engine when the vehicle is stopped, such that said creep-preventing hydraulic circuit means engages said high and low speed clutch means of said high and low speed transmission trains, whereby said one-way clutch is disengaged; and wherein, when the vehicle starts accelerating, said creep-preventing hydraulic circuit means operates to disengage said high speed clutch means, whereby said one-way clutch is engaged to transmit power from the engine through said low speed transmission train.

4,478,109

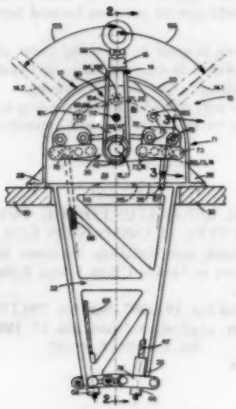
TWIN LEVER CONTROL ASSEMBLY

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed Sep. 28, 1981, Ser. No. 306,167

Int. Cl.³ G05G 5/08; F16H 57/06

U.S. Cl. 74—878 **14 Claims**



1. A twin lever assembly for controlling two functions, the assembly having a body and first and second levers mounted for rotation relative to the body about respective lever axes for controlling a clutch/gearbox unit and engine speed respectively, the first and second levers having respective first and second connecting members adapted to rotate therewith and to cooperate with transmission means connected so as to control the functions, the body having a support member interposed between the two connecting members and having an opening therein, the assembly being further characterized by:

(a) an interlocking shaft fitted in the opening of the support member for movement relative thereto between the connecting members, the shaft having first and second ends, and a length greater than the spacing between opposed faces of the connecting members,

(b) a spring cooperating with the interlocking shaft to urge the first end of the interlocking shaft towards the first connecting member,

(c) the first and second connecting members having sockets adapted to receive the first and second ends respectively of the shaft therein, the first connecting member having a plurality of sockets therein disposed on an arc centered on the respective lever axis,

(d) the first end of the interlocking shaft and the sockets adapted to receive the first end therein being shaped so as to produce a camming effect on the interlocking shaft when the first connecting member rotates, which tends to force the shaft axially against spring force to produce a resilient feel for the first lever, when the first lever is rotated,

(e) the second end of the interlocking shaft and the socket adapted to receive the second end therein being shaped so as to produce essentially no camming effect on the interlocking shaft when a rotational force is applied to the second member, so that there is essentially no tendency for the shaft to move axially when a rotational force is applied to the second lever,

(f) the first and second ends being spaced apart so that when the first end cooperates with one socket on the first connecting member, the second lever can be rotated, and when the second end cooperates with the socket of the second connecting member, the first lever can be rotated.

4,478,110

INSULATION STRIPPING APPARATUS

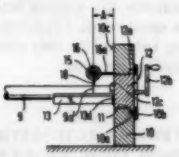
Hans Undin, Åkersberga, and Hans Wiener, Täby, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,205

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1981, 3149426

Int. Cl.³ H02G 1/12

U.S. Cl. 81—9.51 **17 Claims**



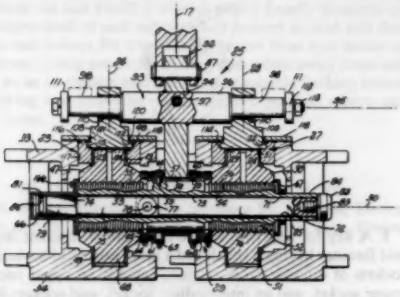
1. Apparatus for stripping insulation from electrical conductors having a circular cross-section, comprising a stationary stand, a rotor member including a circular base plate and mounted on said stand for rotation about an axis; means for rotating the rotor member about said axis relative to said stand; a support member mounted on said rotor member for rotation therewith and arranged to support a conductor from which an insulation layer is to be stripped in general alignment with said axis; means for cutting insulation and comprising an operative knife edge portion and engagement means; means arranged on said rotor member for movably mounting said insulation cutting means, means for actuating said mounting means and arranged to engage said engagement means; a carrier for said actuating means, said actuating means affecting via said engaging means and upon rotation of said rotor member said knife edge portion so as to impart it a radial inward movement, wherein said carrier comprises a pair of circular guiding grooves formed in said stand concentrically with the axis of said base plate, one of said circular grooves being spaced radially outwardly from the other circular groove, and a connecting groove extending between and interconnecting the said two circular grooves, said knife mounting means including an arm secured in pivotal relationship to said rotor member, and a sleeve slidably mounted on said arm, said engagement means being attached to said sleeve and extending therefrom into engagement with said actuating means.

4,478,111

SUSPENSION OF ADJUSTABLE PIPE SPINNER

Lawrence E. Wells, Anaheim; Boris Kamenster; Preston R. Fox, both of Fountain Valley, all of Calif., and Jerry A. Gill, Spring, Tex., assignors to Varco International, Inc., Orange, Calif.

Filed Aug. 29, 1982, Ser. No. 376,745
Int. Cl.³ B25B *13/50*
U.S. Cl. 81—57.19 19 Claims



1. A pipe spinner comprising:

a plurality of rollers engageable with a pipe at different locations about its periphery and adapted to grip and spin the pipe;

two body members having portions receivable at different sides of said pipe and each carrying at least one of said rollers;

two pivotal connections mounting said body members for swinging movement about two spaced axes respectively between a closed position in which the rollers grip and drive a pipe and an open position releasing the pipe;

an adjustable connection having a portion extending between said pivotal connections, said adjustable connection being operable to shift said pivotal axes toward and away from one another to differently spaced relative positions to grip and drive different sizes of pipe;

powered means for swinging said body members about said axes and between open and closed positions in differently spaced conditions of said axes; and

support means adapted for connection to and support by a suspending element and having portions which extend toward said two axes respectively and which suspend said body members and pivotal connections at essentially the locations of said two pivotal axes in any of said differently spaced relative positions of the axes without transmission of the suspension force through said portion of the adjustable connection which extends between said pivotal connections.

4,478,112

FASTENER FEEDER

Anthony D. Moulton, 305 Melbourne, Columbia, Mo. 65201

Filed Sep. 17, 1982, Ser. No. 419,237
Int. Cl.³ B25B *23/02*
U.S. Cl. 81—57.37 19 Claims

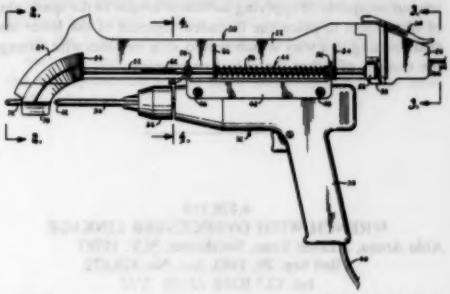
1. A feeder to supply rotary applied fasteners to a tool having an elongated, rotatable fastener applying shaft equipped with a fastener driving tip, said feeder comprising:

an elongated fastener supply magazine configured to receive a plurality of fasteners therein with the fasteners oriented in a direction different from the axis of rotation of said shaft;

guide means communicating with the magazine to conduct each fastener in sequence into a position aligned axially of said shaft and beyond said tip, the guide means including means for releasably holding the fasteners in said position and structure defining a pathway of predetermined size extending from the magazine to said position;

a holder for each fastener, each holder being configured to engage its respective fastener to releasably retain the fastener in the holder and the holders having at least one uniform dimension fitting complementally within the pathway whereby to enhance a uniform movement of the fasteners through the guide means;

spring means in the magazine and disposed to bias the fasteners to move to said position; and



means on the feeder for mounting the latter to the tool, said mounting means including structure to permit relative movement between the feeder and the tool in the direction of the shaft axis whereby pushing the tool with the feeder engaging an object moves the tip relative to a fastener to engage the tip with the fastener to rotatably install the latter.

4,478,113

TOOL FOR AIDING IN THREAD CONNECTING A SPARK PLUG OR OTHER OBJECT IN PLACE

Herwig M. Berneiser, 7521 Peppertree Dr., Stockton, Calif. 95207

Filed May 3, 1982, Ser. No. 373,888
Int. Cl.³ B23B *13/52*
U.S. Cl. 81—64 3 Claims

1. A device for aiding in properly connecting the threaded end segment of a spark plug or similar object into a complementary threaded opening provided by an engine block or like opening when direct visual access is limited and the spark plug or similar object cannot be installed by hand, said device comprising a tubular member including a back end section and flexible front end section having an opened end which is slightly smaller than the unthreaded body of said spark plug or similar object but sufficiently flexible or resilient for forceably receiving said unthreaded body such that its threaded segment extends outwardly therefrom; a rigid tubular sleeve shorter in length than said tubular member positioned concentrically around said member in a close fitting but slidable fashion, said sleeve being slidably movable along said tubular member between a first position entirely rearwardly of the front end section of said tubular member, whereby to allow the unthreaded body of said spark plug or like object to be inserted therein and a second position such that at least a portion of the sleeve is disposed around the front end section of said tubular member, whereby to hold the unthreaded body of said spark plug or like object within the front end segment of said tublar

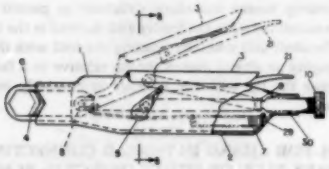
member; and handle connected with the back end section of said tubular member for rotating the latter about its longitudinal axis; said tubular member including an intermediate section which is sufficiently rigid such that the entire tubular member can be rotated at said handle means to loosely connect the threaded segment of said spark plug or like object into said complementary threaded opening in a properly threaded fashion but incapable of applying sufficient torque to the spark plug of like object to place the threaded segment of the latter into said opening in a way which would strip or otherwise damage the threads of either the object or opening.

4,478,114

WRENCH WITH OVERCENTER LINKAGE

Aldo Arena, 3 Lonni Lane, Smithtown, N.Y. 11787

Filed Sep. 29, 1982, Ser. No. 426,672
Int. Cl.³ B25B *13/26, 7/12*
U.S. Cl. 81—363 **4 Claims**



1. A wrench comprising:

a housing with a jaw fixed at one end thereof;

a handle having two portions with a pin therebetween and extending inside said housing and movable with respect to said housing;

a second jaw slidably mounted within said housing, said housing being structured for guiding said second jaw towards said fixed jaw for gripping an object, said second jaw having a slot therein in which said pin is disposed;

each of said jaws having surfaces configured for mating with said object upon contact with said object;

overcenter linkage means coupled between said housing and said second jaw for urging said second jaw towards said fixed jaw, a portion of said linkage means comprising a portion of said handle for actuation of a gripping action by said jaws toward a locked position of said overcenter linkage means;

a lever having a cam, said lever being disposed within said housing for rotation alongside said overcenter linkage means, said cam being effective in at least one position of rotation of said lever to allow said overcenter linkage means to reach a locked position, a pivot point of said linkage means being moved from said locked position by said cam upon rotation of said lever for release of a force exerted by said jaws against said object; and

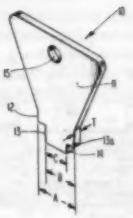
a spring connecting said second jaw and a portion of said housing disposed away from said second jaw for separating said jaws upon displacement of said linkage means from said locked position by said cam and upon movement of said pin to raise said handle, said cam being effective in at least a second position of rotation to prevent said overcenter linkage means from reaching said locked position upon movement of said handle relative to said housing for actuation of a gripping action by said jaws, wherein said spring is in engagement with said cam for holding said cam in preferred positions of rotation.

4,478,115

TAMPER-RESISTANT FASTENER KEY

Thomas J. Ellis, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Jan. 18, 1984, Ser. No. 571,695
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—436 **3 Claims**



1. A key for applying torque to a tamper-resistant fastener, said fastener having a shank and a head, said head having three sockets of circular cross section, namely, an upper socket, a lower socket, and an intermediate socket, said sockets having progressively smaller diameters, the lower socket having the smallest diameter, said upper and lower sockets each being concentric with said shank, said intermediate socket being eccentric with said shank, said key comprising:

a. a flat insertable portion having an integrally connected upper portion, intermediate portion and lower portion;

b. said upper and lower insertable portions of said key having respectively the largest and smallest widths, said widths corresponding to the diameters of the upper and lower sockets of said fasteners;

c. said upper and lower insertable portions of said key having a common center axis;

d. said intermediate insertable portion of said key having a width corresponding to the diameter of said intermediate socket;

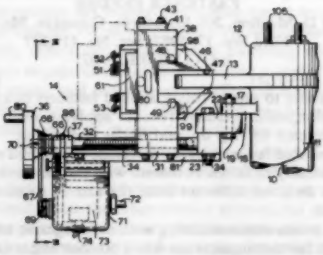
e. said intermediate insertable portion having a center axis which is off-set from the axis of said upper and lower insertable portions.

4,478,116

BELT DRIVE FOR MACHINE FOR RESURFACING VEHICLE BRAKE DISC S

Robert L. Fuller, Rhinelander, Wis., assignor to William J. Kopecko and Joseph O. Duchac, both of Rhinelander, Wis., part interest to each

Filed Sep. 1, 1982, Ser. No. 413,756
Int. Cl.³ B23B *5/02*
U.S. Cl. 82—4 A **4 Claims**



1. Apparatus for automatically driving a brake disc refinishing tool for refinishing vehicle brake discs while said discs are on said vehicle, and said vehicle has caliper mounting brackets,

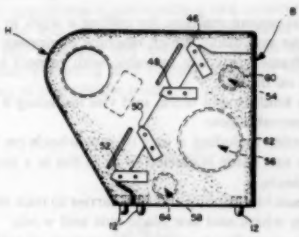
said apparatus comprising, a frame having means detachably connectable to the caliper mounting brackets adjacent to a brake disc, a tool carriage movably mounted on said frame and carrying a pair of tools engageable with opposite faces of said brake disc, a lead screw rotatably mounted on said frame and threadedly received in said carriage to drive said carriage upon rotation of said screw, means mounted on said screw to manually rotate said screw to position said carriage relative to said brake disc, a first pulley fixedly mounted on said lead screw, a motor having a power output shaft, means pivotally mounting said motor on said frame, a second pulley fixedly mounted on said output shaft of said motor, a belt trained around said first and second pulleys for transmitting power from said motor to said screw, spring means for biasing said motor away from said frame so as to tighten said belt, and releasable locking means for locking said motor to said frame in a position where said belt is loose.

4,478,117

SLANT BED FOR CHUCKER MACHINE

Ivan R. Brown, Breesport, and Terrence M. Sheehan, Elmira, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed May 6, 1982, Ser. No. 375,488
Int. Cl.³ B23B *17/00*
U.S. Cl. 82—32 **2 Claims**



1. A bed for a machine tool having a tool element engagable with a workpiece, comprising:

(a) said bed formed of cementitious material and including a way portion and a headstock portion integral therewith;

(b) said way portion including a front, a rear, a bottom and a top;

(c) said headstock portion including a front, a rear, a bottom and a top;

(d) said way portion bottom having front and rear edges;

(e) said headstock portion bottom having front and rear edges;

(f) said way portion bottom having a longitudinal center axis substantially equidistant from said way portion bottom front and rear edges;

(g) three point suspension means projecting from said bed;

(h) two of said three point suspension means being positioned on said way portion bottom, one of said two adjacent said way portion bottom front edge and the other one of said two adjacent said way portion bottom rear edge;

(i) the other one of said three point suspension means being positioned on said headstock portion bottom adjacent said front edge thereof;

(j) said other one of said two of said three point suspension means is adjacent said way portion bottom rear edge intermediate the other two of said three point suspension means;

(k) said three point suspension means are equally spaced longitudinally of said way portion longitudinal center axis;

(l) a substantial portion of said way portion being inclined at between 55° degrees and 65° degrees to the horizontal;

(m) each of said three point suspension means is positioned a different distance from said longitudinal center axis whereby said one suspension means positioned on said headstock portion bottom is furthest from said longitudinal center axis and said one of said two of said three point suspension means adjacent said way portion bottom front edge is closest to said longitudinal center axis;

(n) said way portion includes means imbedded in said bed way portion for mounting a plurality of pairs of cooperating ways including a first pair of cooperating ways mounted above a second pair of cooperating ways;

(o) said bed including three cylindrical torque tubes extending the length of said bed imbedded in said cementitious material; and

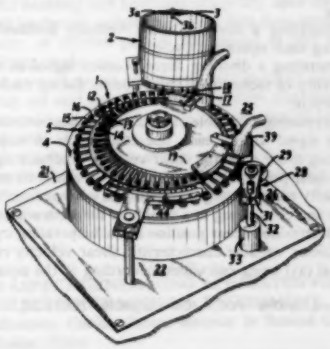
(p) said cylindrical torque tubes including one larger than the others.

4,478,118

METHOD FOR RECOVERING THE CONTENTS OF FILLED PHARMACEUTICAL CAPSULES

Roy W. Lightner, Kansas City, Mo., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed Feb. 25, 1982, Ser. No. 352,158
Int. Cl.³ B26D *3/16, 7/06*
U.S. Cl. 83—24 **1 Claim**



1. A method for recovering the contents of capsules containing pharmaceutical product comprising the steps of:

supporting a capsule in a support means with the axis of said capsule in the vertical direction;

cutting the supported capsule transverse to said axis to create an opening for egress of said pharmaceutical product;

ejecting said capsule from the support means after cutting;

said cutting of said capsule and said ejecting of said capsule occur at a cutting station and an ejecting station, respectively;

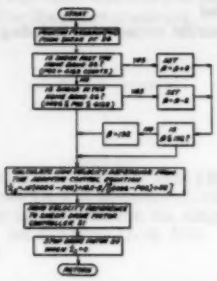
moving said support means to said cutting station whereat said cutting occurs and moving said support means to said ejecting station whereat said ejecting occurs;

and controlling said moving of said support means so that said capsule remains in the vertical direction and so that said capsule remains in essentially the same position in said support means when said support means is moved from said cutting to said ejecting station.

4,478,119
ADAPTIVE CONTROL FOR A DIVIDING SHEAR

Duane B. Larson, Williamsville, N.Y., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 262,087, May 11, 1981, Pat. No. 4,361,063, which is a continuation of Ser. No. 37,553, May 9, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 424,724
Int. Cl.³ B26D 5/20; G05B 19/20
U.S. Cl. 83—42 **1 Claim**



1. A method of controlling a dividing shear which cuts a moving workpiece during one or more shear operating cycles, each operating cycle starting and ending at a home position and having a cutting position therebetween, the method which comprises:

(a) establishing each operating cycle duration and the quantity of the cycles required to make a desired number of cuts into the moving workpiece based on cutting order data;

(b) generating a dividing shear velocity feedback signal during each operating cycle;

(c) generating a dividing shear position signal as one of a plurality of tachometer pulse counts during each operating cycle;

(d) determining a variable characteristic shear velocity reference signal during each operating cycle in response to cutting order data, the shear velocity feedback signal and the shear position signal, the variable characteristic shear velocity reference signal starting as a linear function with time and converting to a nonlinear function with time at a predetermined shear position in each operating cycle, the nonlinear variable characteristic shear velocity reference signal (x_3) being calculated according to the equation:

$$x_3 = 0.15(4096 - POS) + 10.0 - \beta/[(4096 - POS) + 32]$$

where

POS=shear position from home position measured in tachometer pulse counts; and

β=adaptive parameter selected in the range from $0 \leq \beta \leq 192$ based upon shear position; and

(e) driving the dividing shear through the required number of shear operating cycles under control of the shear velocity feedback signal and the variable characteristic shear velocity reference signal such that during each cutting cycle the shear operates according to the following sequence of acceleration and deceleration:

(i) a first linear acceleration from zero velocity at the home position to a velocity at the cutting position equal to that of the moving workpiece, followed by;

(ii) a second linear acceleration for a preset period of time, followed by;

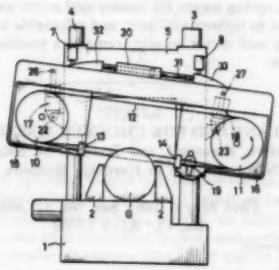
(iii) a first linear deceleration for a preset period of time, followed by;

(iv) a second nonlinear deceleration during which the velocity and acceleration of the shear are caused to equal zero at the home position, thereby preventing the shear from overshooting or oscillating about the home position.

4,478,120
METAL-SAWING MACHINE

Tadahiro Sugimoto, Amagasakishi, Japan, assignor to Daito Seiki Company Limited, Osaka, Japan

Filed Nov. 12, 1982, Ser. No. 441,271
Int. Cl.³ B23D 53/04
U.S. Cl. 83—71 **5 Claims**



1. A metal-sawing machine for cutting a work in a rocking motion of the saw blade, which machine comprises:

a guide frame vertically movable with respect to a work placed on the bed;

a vise for holding said work, said vise including a fixed jaw and a movable jaw;

a saw carrier including a pair of saw wheels on which an endless saw blade is carried so as to run in a loop around said wheels;

a first means for enabling said saw carrier to rock in a cutting plane in which said saw blade cuts said work;

a second means for measuring the amount of said rocking motion of said saw carrier;

a third means for measuring the height of said guide frame or said saw carrier;

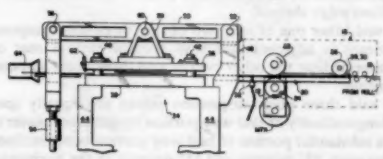
an input unit for inputting the shape and size of said work; and

an arithmetic for calculating the turning points at which said saw blade turns the directions of its rocking motion, thereby ensuring that the rocking range of said saw blade changes in accordance with the shape and size of the work.

4,478,121
DIGITAL FEED SYSTEM

Frank Ritter, Baltimore, and Romano Balordi, Millers, both of Md., assignors to Maryland Cup Corporation, Owings Mill, Md.

Filed May 18, 1982, Ser. No. 379,476
Int. Cl.³ B26D 5/20
U.S. Cl. 83—209 **12 Claims**



1. A system for feeding sheet stock and making blanks therefrom comprising:

blanking means including a blanking punch and die for punching blanks from said sheet stock;

sensor means for developing a blanking signal indicative of operation of said blanking means;

a stepping motor;

sheet stock drive means driven by said stepping motor for feeding said sheet stock to said blanking means;

translator means for providing necessary drive pulses to said stepping motor, said translator means further producing a control output indicative of each said drive pulses; and

counter means for monitoring the length of feed of said sheet stock by decrementing a count contained therein and for generating a stop motor signal a predetermined distance greater than zero before a desired feed length is reached, said predetermined distance allowing the stepper motor to decelerate to a stop at said desired feed length, said count being selected to represent said desired feed length minus said predetermined distance;

disable means being set by receipt of said stop motor signal for initiating a deceleration of said stepping motor by said translator;

time delay means responsive to said sensor means for producing a blank completion signal a predetermined time after receipt of said blanking signal, said predetermined time being sufficient to allow said blanking means to complete punching a said blank;

said blank completion signal resetting said counter means to said count and further resetting said disable means to enable said translator and restart said stepper motor;

said translator starting said stepper motor in response to resetting of said disable means.

4,478,122

PUNCH HEAD FOR A PUNCH PRESS

James R. Hunter, Chadds Ford, Pa., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 26, 1982, Ser. No. 401,445
Int. Cl.³ B26D *5/08*
U.S. Cl. 83—549 **7 Claims**

1. A punch press comprising a punching head (30) including a driven crankshaft (42), an upper tool support (92) for supporting a plurality of punches (32), a lower tool support (94) for supporting dies (34) which are associated with the punches (32), an interposer (50) disposed between the crankshaft (42) and the punch (32) for reciprocating the punch (32) as the crankshaft (42) rotates, a clutch (46) for connecting the crankshaft to a drive when energized, a worksheet positioning system (20) for relative positioning of a workpiece (14) and the punching head (30), said press characterized by:

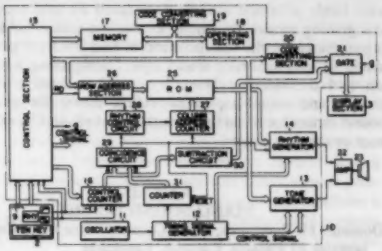
the eccentric of said crankshaft (42) causes the punch (32) to be fully withdrawn within the upper tool support (92) for more than 90 degrees of crankshaft (42) rotation.

4,478,123

ELECTRONIC EQUIPMENT WITH TONE GENERATING FUNCTION

Toshifumi Hoshii, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 330,009, Dec. 11, 1981, abandoned. This application Sep. 22, 1983, Ser. No. 534,396
Claims priority, application Japan, Dec. 23, 1980, 55-181352
Int. Cl.³ G10H *1/42, 7/00*
U.S. Cl. 84—1.03 **5 Claims**



1. Electronic equipment having a rhythm sound generating function, comprising:

memory means for storing a plurality of rhythm pattern data items;

a keyboard provided at a key input section, for specifying note data at a performance mode;

mode changing means provided at said key input section for changing the mode of said keyboard from said performance mode to a rhythm specifying mode;

means for enabling said keyboard to specify, upon operation of said keyboard, a rhythm pattern data item among said plurality of rhythm pattern data items at said rhythm specifying mode;

read-out control means coupled to said memory means for reading out said specified rhythm pattern data item from said memory means responsive to operation of said keyboard; and

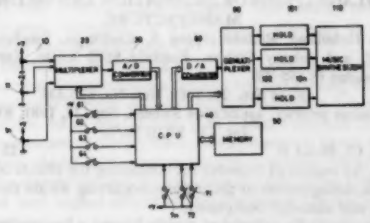
rhythm sound generating means coupled to said memory means for generating a rhythm sound according to said specified rhythm pattern data item read out from said memory means.

4,478,124

SOUND ASPECT GENERATING APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Tadao Kikumoto, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Mar. 25, 1983, Ser. No. 478,735
Claims priority, application Japan, Jul. 27, 1982, 57-131805
Int. Cl.³ G10H *7/00*
U.S. Cl. 84—1.19 **6 Claims**



1. A sound aspect generating apparatus for an electronic

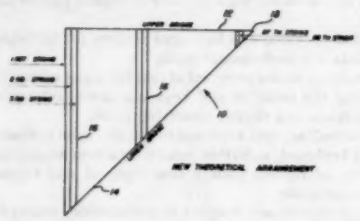
musical instrument, wherein a sound aspect is composed of a plurality of parameters and a musical tone signal is produced based on such composed sound aspect, comprising: parameter setting means for setting a plurality of parameters each constituting at least two kinds of sound aspects, sound aspect designating means for designating at least two kinds of sound aspects represented by said plurality of parameters set by said parameter setting means, arbitrary sound aspect designating means for designating an arbitrary point between said at least two kinds of sound aspects designated by said sound aspect designating means, derivative evaluating means for evaluating a derivative of each of said parameters between said at least two kinds of sound aspects designated by said sound aspect designating means, parameter evaluating means for evaluating a parameter for the interpolation of said arbitrary point designated by said arbitrary sound aspect designating means based on said derivative evaluated by said derivative evaluating means, and sound aspect providing means for providing a sound aspect based on the parameters evaluated by said parameter evaluating means.

4,478,125

PIANO SOUND BOARD

Domingo H. Rodriguez, Avda. Guzman Blanco Ota Corubo, Los laureles El Paraiso, Caracas, Venezuela

Filed Nov. 15, 1982, Ser. No. 441,788
Int. Cl.³ G10C *3/04*
U.S. Cl. 84—212 **6 Claims**



1. A piano sound board comprising an upper bridge a plurality of lower bridges each set at an angle to the upper bridge and in a common plane therewith, the extensions of said lower bridges coinciding at one end of said upper bridge, a plurality of strings arranged in a number of groups corresponding to the number of lower bridges, the strings in each group being secured at one end to the upper bridge and at the other end to the respective lower bridge corresponding to said grouping, said strings extending at right angles to said upper bridge, the longest of said strings in each group defining with the upper bridge and the corresponding lower bridge at least a portion of a right triangle, the remaining strings in each group being arranged parallel thereto at regular intervals.

4,478,126

CHAMBER FOR CONTAINING EXPLOSIONS, DEFLAGRATIONS OR DETONATION AND METHOD OF MANUFACTURE

Dan Holmlund, Rönnbärsvägen 6, Karlskoga, Sweden S-691 47, and Johnny Ohlson, Postlada 8603 Kilsta, Karlskoga, Sweden (S-691 33)

Filed Sep. 24, 1982, Ser. No. 423,339
Claims priority, application Sweden, Sep. 22, 1981, 8105585
Int. Cl.³ F42B *33/02*
U.S. Cl. 86—1 B **13 Claims**

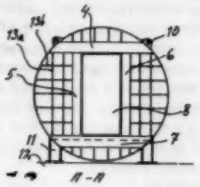
1. An improved chamber for containing the effects of explosions, deflagrations or detonations occurring within the chamber, said chamber comprising:

an essentially cylindrical mantle having a longitudinal axis, first and second opposite ends and an inner wall;

first and second essentially circular disks welded at their respective circumferences to said inner wall at locations spaced inwardly from said first and second opposite ends;

a first plurality of stiffening plates affixed on edge to the outer surface of said first circular disk and extended in said longitudinal direction;

a second plurality of stiffening plates affixed on edge to the outer surface of said second circular disk and extended in said longitudinal direction;



a third plurality of stiffening plates affixed on edge to the outer surface of said first circular disk and extended in said longitudinal direction and at traverse angles to said first plurality of stiffening plates; and

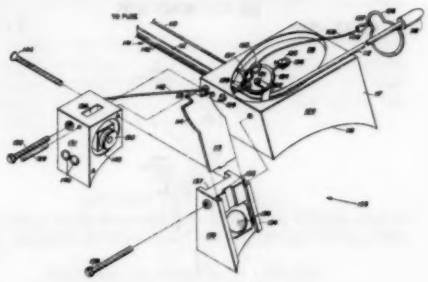
a fourth plurality of stiffening plates affixed on edge to the outer surface of said second circular disk and extended in said longitudinal direction and at traverse angles to said second plurality of stiffening plates.

4,478,127

BOMB SADDLE INTERFACE MODULE

George N. Hennings; Larry F. Brauer, and Raymond H. DeHarrold, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1982, Ser. No. 422,045
Int. Cl.³ B64D *1/04*; F42C *5/00, 15/12*
U.S. Cl. 89—1.5 D **11 Claims**



1. A bomb saddle interface module comprising:

an assembly housing having a topside recess;

a generator housing attached to said assembly housing:

a means for producing electrical power operably mounted within said generator housing;

a wind duct housing attached to said assembly housing and to said generator housing;

an arming wire;

a retaining pin;

a link flexibly attached to said assembly housing in said topside recess and engaging said arming wire and said retaining pin; and

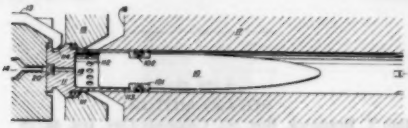
a lanyard having one end engaging said link.

4,478,128

PROJECTILE CARRIER FOR LIQUID PROPELLANT GUN

William L. Black, China Lake, Calif., and Kenneth L. Moore, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1981, Ser. No. 262,351
Int. Cl.³ F41F *1/04*; F42B *5/16, 5/36*
U.S. Cl. 89—7 9 Claims



1. An improved round for use in a liquid propellant gun comprising:

a projectile; and

an abbreviated carrier including

a body having an open front end dimensioned to provide frictional engagement with said projectile for receiving said projectile and a rear end;

a plurality of injection ports located about a circumference, said ports communicating to an expandable volume between said body rear end and said projectile;

sealing means for preventing the escape of propellant to a breech, located between said injection ports and said rear end of said body;

an extractor groove located proximally to said rear end between said sealing means and said rear end;

a primer cavity located in said rear end of said body;

a primer flash hole formed in said body, located between said primer cavity and said expandable volume for communicating therebetween; and

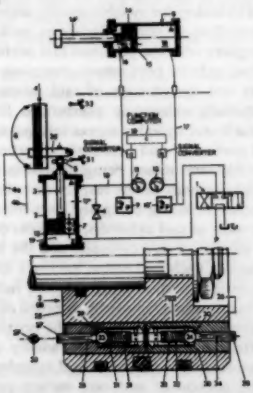
ignition means for igniting liquid propellant located within said primer cavity.

4,478,129

APPARATUS FOR THE EXACT POSITION FEEDBACK OF A DOUBLE-ACTING POWER PISTON IN A HYDRAULIC POWER CYLINDER

Heinz D. Hannes, Düren-Echtz; Josef Lothmann, Langerwehe, and Ludwig Walther, Düren-Niederau, all of Fed. Rep. of Germany, assignors to Zimmermann & Jansen GmbH, Düren, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,925
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014432
Int. Cl.³ F01B *25/26*
U.S. Cl. 91—1 2 Claims



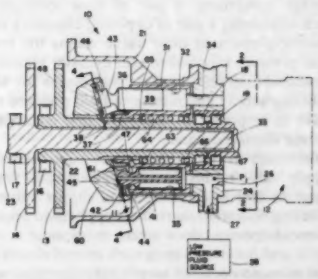
1. An apparatus for the exact position feedback of a double-acting power piston in a hydraulic power cylinder subject to extreme environmental conditions especially high temperatures comprising: a double-acting detecting follower cylinder having a displacement volume equivalent to that of said power cylinder; a detecting piston in said detecting cylinder; an electrical detection means for detecting and indicating the position of said detecting piston; a first fluid conduit connecting the working space on one side of said power piston to said detecting cylinder on one side of said detecting piston; a second conduit connected to the spaces in said cylinder on the other sides of said pistons; a fluid pump; a fluid reservoir; a control valve operatively connected in said second conduit to selectively connect said spaces on the other sides of said pistons to said pump, and to said reservoir; a first and second pressure limiting switch operatively connected in said first and second conduits, respectively, to prevent transfer of pressure through said conduits which exceeds a predetermined value; a fluid passage through each piston interconnecting the spaces in each respective cylinder on opposite sides of the piston; valve means in each passage to control the flow of fluid therethrough; a pressure measuring device operatively connected to each pressure limiting switch to indicate the pressure in said conduits; a signal converter operatively connected to each of said pressure measuring devices to convert the pressure values to corresponding electrical signals; and a function computer operatively connected to said signal converters for controlling the position of said power piston in accordance with a pre-set value.

4,478,130

ARRANGEMENT FOR SLIPPER CAVITATION EROSION CONTROL AND IMPACT REDUCTION

Kenneth I. Brenner, and Joseph F. Wollschlager, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 19, 1981, Ser. No. 245,478
Int. Cl.³ F01B *13/04*
U.S. Cl. 91—6.5 4 Claims



1. A slipper and swashplate for use in piston type hydraulic apparatus, the combination including:

said swashplate having a surface upon which said slipper interfaces, said slipper mounted for movement along said swashplate surface,

a high fluid pressure source and a low fluid pressure source delivered alternately to and through openings in said slipper and said swashplate,

said swashplate including a pair of vent passages, each of said vent passages having one end thereof opening at said swashplate surface and said slipper-swashplate interface and the other end of said vent passage opening to an environment in which the ambient pressure is lower than either of said fluid pressure sources to thereby allow energy dissipation and provide reduced cavitation erosion and load impact effects at said slipper-swashplate interface,

said swashplate having high and low pressure interface regions as a consequence of said alternate delivery of said high and low pressure fluid,

said vent passage openings being located at the entrance end of each of said interface regions.

4,478,131

ELECTRO-PNEUMATIC DOOR CONTROL APPARATUS

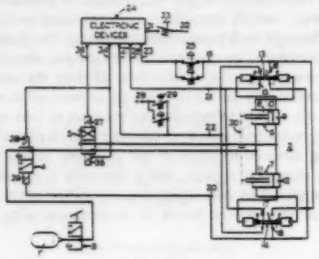
Peter Liermann, Barsinghausen; Karl-Heinz Hesse, Gehrden; Dietmar Meyer, Barsinghausen, and Wolfgang Gudat, Hanover, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,393

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032516

Int. Cl.³ F15B *11/15, 13/044, 15/20*

U.S. Cl. 91—356 **1 Claim**



1. An electro-pneumatic door control apparatus for use on public vehicles for effecting reversal of door movement in the event of an obstruction in the path of movement of the door, said door control apparatus comprising:

(a) fluid pressure operable cylinder means operatively connected to a vehicle door for alternatively effecting opening and closing movements thereof, said cylinder means further comprising a pair of door-operating cylinders, each containing a pair of opposing chambers and a piston;

(b) solenoid-operated door valve means for reversing the fluid pressure supplied to said cylinder means;

(c) solenoid-operated supply valve means for alternatively effecting supply and release of fluid pressure to said door valve in response to respective first electrical signal or second electrical signal;

(d) electronic means connected to said solenoid-operated supply valve means for transmitting such first electrical signal to said solenoid-operated supply valve means for effecting operation thereof to supply fluid pressure to said solenoid-operated door means in response to an operator input, and for transmitting such second electrical signal to said solenoid-operated supply valve in response to sensing a door obstruction during a door-opening operation, said electronic means further having a signal decoder, a door position flip-flop device connected with said signal decoder for storing the respective door position, a monitoring logic device connected to said signal decoder and said door position flip-flop device, a control logic device connected to said signal decoder and said door position flip-flop and said monitoring logic device, and a valve solenoid control device connected to said control logic device without output end stages for transmitting electrical energy to said solenoid-operated door valve to properly connect the direction of fluid pressure to effect door opening or closing, and said electronic means having an inlet connected to the push button and two inlets connected to the reversing switches;

(e) a manually operable electric push button for manually effecting energization of said door valve;

(f) a manually operable emergency valve device to provide manual venting of said cylinders;

(g) a pair of reversing switches for evaluating the differential pressure in the cylinder chambers, thereby sensing obstructions on opening and closing;

(h) a pair of limit switches for determining respective end positions of door closed and open positions; and

(i) said electronic means having suppressing means for suppressing a reversing signal transmitted to inlets of said electronic means connected to reversing switches by a control logic device when an operator-initiated door command exists at such inlet connected to said electric push button.

4,478,132

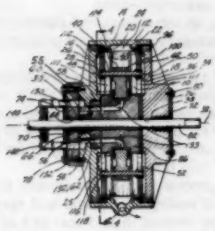
ROTARY MOTOR

Elijah Y. Braddock, Box 182, Columbia City, Ind. 46725

Filed Jun. 16, 1983, Ser. No. 505,062

Int. Cl.³ F01B *13/06*

U.S. Cl. 91—485 **7 Claims**



1. A motor comprising: a hollow, generally cylindrical stationary housing, a rotating housing journaled for rotation about a fixed axis in said stationary housing, a plurality of cylinders in said rotating housing, said cylinders extending radially outwardly with respect to said axis, a piston reciprocally received in each said cylinder, a cam member fixedly mounted in said stationary housing and including a cam surface eccentric with respect to said axis and having at least one straight cam surface portion disposed at an inclined angle with respect to movement of said cylinders, the outer ends of said cylinders extending radially outwardly beyond said cam surface for all rotational positions of said housing, cam follower means fixedly secured to said pistons intermediate the ends thereof and operatively engaging said cam surface, inlet port means operatively connected between a source of pressurized fluid and said cylinders for synchronously, sequentially applying pressurized fluid to said cylinders as each said cylinder moves into registry with the proximal first portion of said cam surface portion, exhaust port means communicating between said cylinders and the exterior of said motor for synchronously, sequentially exhausting pressurized fluid from said cylinders as each said cylinder moves into proximity with the distal second portion of said cam surface portion, said pistons and said cam follower means being limited in movement between the opposite ends of the respective cylinders, said exhaust port means including elongated slots formed in the axially opposite walls of said cylinders, said slots communicating between the interior of said cylinders and the interior of said stationary housing, each said piston having a top surface portion, said top surface portion being disposed radially inwardly with respect to the radially inwardly disposed ends of said slots when said cylinder is in registry with the proximal portion of said cam surface portion and being radially displaced outwardly beyond said slot ends when said cylinders are in registry with distal portion of said cam surface portion, respectively.

4,478,133

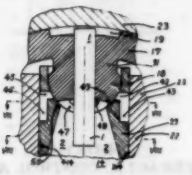
ARRANGEMENT ON MEMBERS WHICH OSCILLATE OR PIVOT

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 765,221, Feb. 3, 1977, Pat. No. 4,193,336, which is a continuation-in-part of Ser. No. 528,346, Nov. 29, 1974, Pat. No. 4,037,523. This application Jan. 7, 1980, Ser. No. 110,080

Int. Cl.³ F01B 13/06

U.S. Cl. 91—488 7 Claims



1. An arrangement to reduce friction in device which includes at least two bodies, two members and at least two faces, wherein said faces slide along each other under a pivoting load;

wherein one of said bodies contains a space for the reception of at least a portion of one of said members;

wherein one of said members is provided with a bed to bear thereon a pivot portion of the other of said members;

wherein said members pivot relative to each other in alternating opposite directions when one of said members is borne insaid bed of the said other of said members;

wherein one of said members does a movement in said space whereby it slides with it outer face along a respective wall face of a wall which borders said space,

wherein said bodies include retaining portions located on opposite ends of said members to limit the extent of said movement,

wherein at least one of said bodies forms parallel retaining-walls on two opposite sides of one of said members;

wherein at least one pocket is provided in one of said members and open toward said wall face;

wherein one of said members is provided with a first passage means communicated to a chamber with fluid under pressure and a second passage means communicating with said pocket;

wherein a third passage means is provided in the other of said members for communication with said first passage means and alternating communication and discommunication with said second passage means during said pivoting of said members;

wherein at least one of said bed has an inner recess of a non-circular cross-section;

wherein said recess is open toward the other of said members;

wherein an element of a cross-section which is at least partially complementary to said cross-section of said recess, is attached to one of said members and extends into said non-circular cross-section recess of the other of said members;

wherein said passages supply at least periodically fluid into said pocket, serve to maintain fluid and pressure in said pocket and to carry at least a portion of the load of said member on said wall face;

wherein said pocket is located in the direction of the load of the respective member onto said wall face;

wherein said movement includes an oscillation with a stroke under load and another stroke under less load;

wherein said movement is present along the concentration of said load of the respective member onto said wall face; and;

wherein said recess and said element serve to maintain an equal direction of said members relative to each other whereby they maintain said direction of said load and keep said movement in said concentration and direction of said load by preventing displacement of said pocket out of said concentration and direction of said load.

4,478,134

SWASH PLATE TYPE HYDRAULIC DEVICE

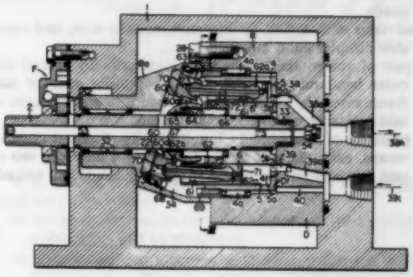
Eiichiro Kawahara, Tokorozawa, and Koichi Ikeda, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,310

Claims priority, application Japan, Oct. 31, 1980, 55-153014

Int. Cl.³ F01B 13/04

U.S. Cl. 91—488 5 Claims



1. A swash plate type hydraulic device comprising a frame; a rotary shaft rotatably supported on said frame; a cylinder block mounted on said rotary shaft for rotation therewith, a plurality of cylinder bores being formed in said cylinder block and arranged in a circular pattern around the axis of rotation of said cylinder block; a plurality of plungers slidably fitted in said cylinder bores for reciprocating movement so as to define therein hydraulic chambers, said hydraulic chambers being selectively placed into communication with a low pressure hydraulic passage when said plunger is in a suction stroke and into communication with a high pressure hydraulic passage when said plunger is in an exhaust stroke; a swash plate mounted on said frame in an inclined manner with respect to said rotary shaft in opposing relation to said plungers; an annular shoe being in abutting engagement with said swash plate for relative rotation, said shoe having a slide surface opposed to said swash plate, said slide surface being formed with a plurality of hydraulic pockets in communication with said hydraulic chambers in said plungers via hydraulic passages;

a plurality of connecting rods operatively connecting said shoe and said plungers, said hydraulic passages which communicate said hydraulic pockets with said hydraulic chambers being formed in and extending through said plungers, said connecting rods and said shoe; and a pair of synchronous gears respectively fixedly secured to said cylinder block and said shoe in meshing engagement with each other for synchronized rotation of said block and said shoe.

4,478,135

ROTATING CYLINDER CONTINUOUS EXTERNAL COMBUSTION ENGINE

Everett F. Irwin, 430 Orangewood Dr., Dunedin, Fla. 33528

Division of Ser. No. 202,946, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 358,190, Mar. 15, 1982, Pat. No. 4,413,486. This application Sep. 27, 1982, Ser. No. 424,396

Int. Cl.³ F02G 3/00

U.S. Cl. 91—492 7 Claims

1. A rotating cylinder continuous external combustion engine, comprising, a non-rotatable cylindrical in configuration

frame assembly having a longitudinally disposed axis of symmetry,

a rotatably mounted rotor means,

said rotor means eccentrically disposed relative to the longitudinal axis of symmetry of said frame means.

a first and second bank of axially spaced cylinder heads disposed in radial relation to said axis of symmetry,

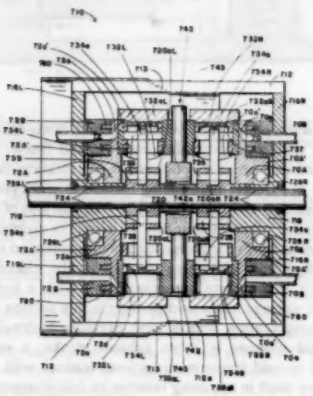
a first and second bank of complementally formed pistons, each piston mounted in a different one of said cylinder heads,

a pair of rotatably mounted, longitudinally spaced circular band members disposed at opposite ends of said frame assembly and having a rotational axis coincident with said frame axis of symmetry, said circular bands abutting and rotating conjointly with associated ones of said cylinder heads,

said rotor mounted to, for conjoint rotation with, said rotatable circular band members,

a pair of non-rotatably mounted, lognitudinally spaced circular band members disposed at opposite ends of said frame assembly longitudinally outward of and adjacent to said rotatably mounted circular bands,

a plurality of substantially longitudinally disposed channel means, each channel means formed in a different one of said first and second banks of cylinder heads and extending through an adjacent portion of an associated rotatable circular band,



a plurality of port means formed in both of said non-rotatable circular bands, and extending completely therethrough so that transient alignment of said rotating channels and said non-rotating ports attendant operation of the engine provides valving means for controlling the operation of the engine,

said non-rotatable circular bands having sealing means on the interior faces, respectively, thereof, to inhibit leakage of fluid under pressure when said rotating channels are in alignment with the imperforate portions of said non-rotatable circular bands and to separate the angularly adjacent rotating channels of each bank from each other,

said respective interior faces of said non-rotatable circular band members having first and second concentric grooves of annular configuration formed therein,

said grooves having predetermined, different diameters so that a first groove of greater predetermined diameter lies radially outward of a second groove,

said respective interior faces further having a plurality of radially disposed grooves of predetermined depth greater than the depths of said concentric grooves formed therein,

a plurality of annular sealing rings,

a plurality of radial sealing vanes,

a plurality of bias means,

said annular sealing rings and radial sealing vanes respectively disposed in different ones of said grooves and urged outwardly thereof by said bias means so that said rings and vanes make sliding contact with said rotating circular bands, respectively,

said rings and vanes collectively defining therebetween a plurality of fluid-tight volumes from which said fluid under pressure cannot escape, said prevention of fluid loss increasing the efficiency of said engine.

4,478,136

ELECTROHYDRAULIC CONTROL ARRANGEMENT FOR HYDROSTATIC MACHINE

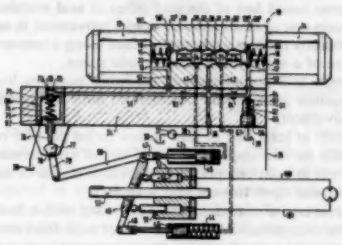
Joachim Heiser, Stuttgart; Volkmar Leutner, Friolzheim; Eckard Schuttenberg, Stuttgart, and Dieter Weigle, Urach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,094

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133110; Apr. 16, 1982, 3213958

Int. Cl.³ F04B *1/30*; F15B *9/10, 13/16*

U.S. Cl. 91—506 **12 Claims**



1. An electrohydraulic control arrangement for a hydrostatic machine communicating with at least one high pressure conduit and having a displacing element with a stroke determined by a control member movable between a plurality of positions, the arrangement comprising

at least one pressure-actuated regulating piston arranged to adjust the control member;

at least one proportionally operating electro magnet;

centering spring means;

a valve slider through which a pressure medium acts upon said regulating piston arranged so that said proportionally operating magnet acts upon said valve slider and said centering spring means holds said valve slider in a central position, said valve slider being withdrawable to a neutral position in response to adjusting the machine by a feedback signal coming from the control member in correspondence with an input electric signal, said valve slider having two sides arranged so that one of said sides is acted upon by a constant pressure, whereas the other of said sides is acted upon by a variable pressure depending on a position of the control member;

means for acting upon said side of said valve slider with a constant pressure; and

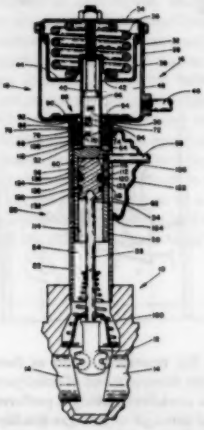
means for acting upon said other side of said valve slider with a variable pressure depending on a position of the control member.

4,478,137

HYDRAULIC BRAKE ACTUATOR

James R. Clark, Milford, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1983, Ser. No. 457,824
Int. Cl.³ F01B 7/20; F16J 15/18
U.S. Cl. 92—63 7 Claims



1. A hydraulic brake actuator for a wedge type brake comprising:

a tubular structure extending from a housing of said brake to include an extended end of a stem of a wedge of said brake therein;

a primary cylinder mounted on said tubular structure;

a primary piston mounted for sealed movement within said primary cylinder and having rod means extending from a first side thereof into said tubular structure to be operably connected to said extended end of said stem;

biasing means acting on a second side of said primary piston and capable of moving said primary piston toward a first position within said primary cylinder for actuation of said brake;

piping means secured to said primary cylinder to be capable of being joined to a primary hydraulic control system for selective introduction of primary hydraulic fluid to said primary cylinder at said first side of said primary piston to cause movement thereof in opposition to said biasing means to a second position within said primary cylinder to prevent said actuation of said brake by said biasing means;

means for preventing a loss of said primary hydraulic fluid from said primary cylinder through an annular space between an interior surface of said tubular structure and an exterior surface of said rod means;

said means for preventing said loss of said primary hydraulic fluid including a floating seal carrier surrounding said rod means and supporting a sealing means extending inwardly to make sealing contact with said exterior surface of said rod means and means for preventing passage of said primary hydraulic fluid between said floating seal carrier and said interior surface of said tubular structure; and

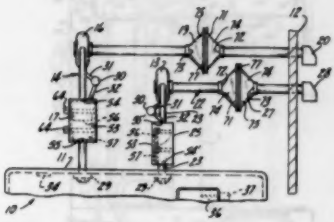
said means for preventing passage of said primary hydraulic fluid between said floating seal carrier and said interior surface of said tubular structure including a mechanical face seal disposed between an inwardly extending carrier retaining ring mounted at an end of said tubular structure toward said primary cylinder and an end of said floating seal carrier adjacent said primary cylinder.

4,478,138

SUPPLEMENTAL COOLING SYSTEM

Paul L. Venditti, St. Clair Shores, and Harmon S. Bayer, West Bloomfield, both of Mich., assignors to Winteraire, Inc., Detroit, Mich.

Filed Sep. 30, 1982, Ser. No. 431,699
Int. Cl.³ F24F 13/00
U.S. Cl. 98—33 R 3 Claims



1. A cooling system for circulating ambient air through an enclosure comprising:

an intake system means for drawing cool air from a source of ambient air into an enclosure;

an exhaust system means for drawing warm air from the enclosure to exhaust the warm air into the source of ambient air;

first and second valve units being mounted in said intake system means and said exhaust system means respectively, said first and second valve units each comprising a housing having an inlet port for receiving air into the housing on one end, an outlet port on another end for allowing air to leave the housing, first and second valve elements, being moveable between an open position and a closed position wherein air flow through the housing is blocked in two spaced locations, said first valve element being disposed closer to the inlet port than said second valve element, said first and second valve elements when closed forming an insulating air pocket within the housing; and

means for driving said first and second valve elements between the open and closed positions; and

first blower means mounted adjacent the inlet port of the intake valve means for blowing warm air toward said first valve element when in the closed position to prevent the forming of condensation thereon, and second blower means mounted adjacent the outlet port of the exhaust valve unit for blowing warm air toward said second valve element when in the closed position to prevent the forming of condensation thereon.

4,478,139

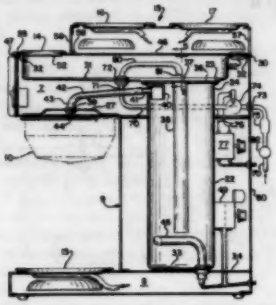
BEVERAGE MAKING MACHINE

John D. Zimmerman, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Jan. 31, 1983, Ser. No. 462,139
Int. Cl.³ A47J 31/00
U.S. Cl. 99—280 5 Claims

1. Beverage brewing apparatus capable of operating either automatically or by cold water pour-in and comprising, in combination, a cold water basin provided with both a drain opening and a fill opening through which a batch of cold water may be poured or dumped, a cold water inlet line for supplying cold water to said basin from a pressurized water supply, valve means in said cold water inlet line for opening and closing said line, means for opening and closing said valve means to either allow cold water to flow through said cold water inlet line and into said basin or prevent cold water from flowing through said line, timer means operatively associated with said valve means for closing said valve means a predetermined time interval after each opening thereof thereby allowing a predeter-

mined quantity of cold water to flow to said basin each time said valve means is opened, a hot water tank under said basin, means for heating water in said tank, a cold water tube having its upper inlet end connected to said drain opening and having its lower outlet end disposed in the lower portion of said hot water tank whereby cold water in said basin empties by gravity



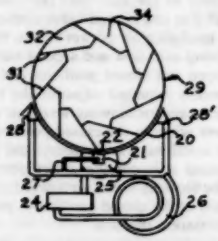
into the lower portion of said hot water tank, a hot water spray head, a siphon tube interconnecting said spray head with a hot water outlet opening adjacent the top of said hot water tank whereby hot water displaced by cold water entering the lower portion of said tank flows through said siphon tube to said spray head through which it discharges, and means for supporting a brewing funnel beneath said spray head.

4,478,140

FRYER WITH OIL CIRCULATION AND CONVEYOR

Robert F. Bullock, P.O. Box 454, Conyers, Ga. 30207

Filed Aug. 2, 1982, Ser. No. 404,501
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—404 **8 Claims**



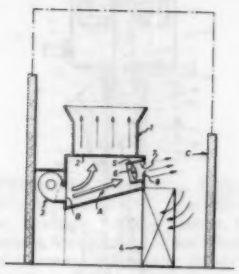
1. A fryer wherein food to be cooked is placed in cooking oil heated to a cooking temperature, said fryer including a generally semi-cylindrical tank for receiving a quantity of oil, a drain for discharging said oil, said drain extending along the bottom of said tank, and a manifold for supplying said oil to said tank parallel to said drain and above said bottom, a hub concentric with said tank and including a plurality of perforate shelves extending outwardly from said hub for defining pockets between adjacent shelves, the centerline of said hub being above the level of oil in said tank, said shelves being arranged to be along a chord at such angle that food lifted from said tank by a shelf will slide off the shelf when the shelf is above the tank wall, means for rotating said hub so that food will be discharged at the front of said fryer, and substantially imperforate side plates fixed to said hub, said side plates being concentric with said hub and extending generally to the bottom of said tank and enclosing the sides of said shelves, said centerline of said hub being parallel to said drain and said manifold so that oil moves generally in a direction parallel to the direction of motion of food through said tank.

4,478,141

APPARATUS FOR HEAT TREATMENT

Sten-Eric Svensson, Ängelholm, and Gustaf A. Andersson, Viken, both of Sweden, assignors to Frigoscandia Contracting AB, Helsingborg, Sweden

Filed Feb. 22, 1983, Ser. No. 468,290
Claims priority, application Sweden, Mar. 1, 1982, 8201258
Int. Cl.³ A23B *7/00*; A23N *12/00*; F26B *3/00, 21/06*
U.S. Cl. 99—476 **8 Claims**



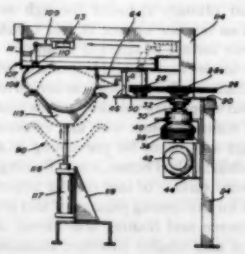
1. Apparatus for treatment, such as freezing, of products such as food in the form of a bed of solid particles, said apparatus comprising a container having a perforated bottom for the product bed and through which gas is adapted to flow to the product bed in a direction generally upward and at a velocity sufficient to fluidize the product bed, said apparatus including at least one fan for causing gas to flow beneath said container and through the product bed via said perforated bottom and including a heat exchanger and a by-pass conduit, said by-pass conduit being positioned to divert gas from beneath said perforated bottom that would otherwise flow therethrough, said bypass conduit being provided with damper means which operates repetitively to raise and lower the gas pressure beneath the perforated bottom to cause the gas through the product bed to pulsate, said fan said heat exchanger being positioned relative to said container and said by-pass conduit in flow passage means for causing substantially all the gas flowing through each of said container and said conduit to pass through both said heat exchanger and said fan.

4,478,142

BALLOON-PRINTING APPARATUS WITH SILK-SCREEN

Christos Santorinaos, 5643 Woodbury Ave, Montreal, Canada H3T 1S6

Filed Jan. 13, 1984, Ser. No. 571,381
Int. Cl.³ B41F *17/00*
U.S. Cl. 101—35 **10 Claims**



1. An apparatus for printing balloons comprising a supporting frame, an endless conveyor means movably supported by said frame, a plurality of balloon neck-receiving nipples and a

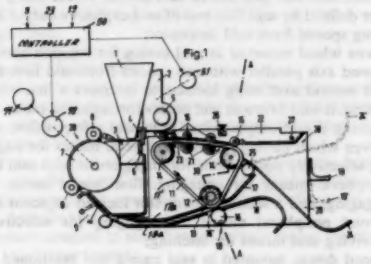
like number of balloon-positioning members carried by said conveyor means in spaced-apart position therealong, said balloon-positioning members including a ring movable with respect to said nipple between a retracted position and an extended outward position, said ring adapted to surround the neck of a balloon attached to said nipple and stretch said neck when said ring is in extended position, so as to steady said balloon with respect to said nipple, means for moving said conveyor means step by step in a closed path with said nipples and balloon-positioning members successively stopping at a plurality of spaced-apart functional station, a first one of said stations allowing attaching a deflated balloon to said nipple, means at a second station to inflate the balloon, means at a third station to extend the balloon-positioning member to operative position, a silk-screen printing press mounted at a fourth station and means to cause the inflated balloon to be printed by said press, means at succeeding fifth stations to cause the drying of the ink printed on the balloon, means at a sixth station to retract the balloon-positioning member and means at a seventh station to detach the printed balloon from said nipple.

4,478,143

PRINTER

Wolfgang Hendrischk, Ulm, and Gerhard Nolte, Neu-Ulm-Offenhausen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,927
Int. Cl.³ B41J *15/08, 15/16, 13/08*
U.S. Cl. 101—93.05 **11 Claims**



1. A printer for printing on a sheet and including feeding and advancing means acting on the sheet for placing it in the range of a transversely movable printing head, cooperating with a platen, there being a cutter disposed downstream from the printing head and an ejection device downstream from the cutter, the advancing means including motor drive and first friction drive means subject to stop and go control, the improvement comprising:

the ejection device including second friction-driven means arranged downstream from the cutter for engagement of a side of the sheet that faces the platen, further including spring-biased, smooth-surface idler roller means disposed adjacent to the second friction drive means, also downstream from the cutter, and facing a side of the sheet that faces the head; and

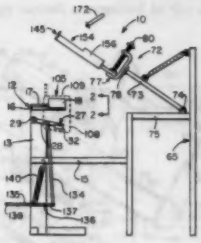
control means for controlling the first and second friction drive means, so that, just prior to cutting, the second friction drive means of the ejection device stops after the first friction drive means of the advancing means has stopped.

4,478,144

CAP PRINTING SYSTEM

Ferris A. Maloof, P.O. Box 778, McCaysville, Ga. 30555

Continuation-in-part of Ser. No. 030,635, Apr. 16, 1979, Pat. No. 4,266,476. This application Nov. 10, 1980, Ser. No. 205,695
Int. Cl.³ B05C *17/06*
U.S. Cl. 101—126 **3 Claims**



1. An improved apparatus for silk screen printing on curved flexible panels of baseball caps and like curved flexible objects, said apparatus comprising:

a curved printing platform for supporting a panel of a cap thereon, said platform defining a predetermined curvature;

movable cap shaping means associated with said platform for causing a flexible panel of a cap supported by said platform to take a curvature conforming to said curvature of said platform;

a flexible silk screening printing screen;

resilient means for biasing said printing screen to take a flat configuration;

means for transferring ink through said printing screen to said flexible panel supported on said printing platform; and

screen shaping means for overcoming the bias of said resilient means and for temporarily causing said silk screening printing screen to take a curved configuration defining a curvature which cooperates with the curvature of said platform to enhance the transfer of ink to the panel.

2. A method of silk screen printing on curved flexible panels of baseball caps and like curved flexible objects, said method comprising the steps of:

stretching silk screening material across a resilient, normally flat border;

attaching the screening material to the resilient border to form an integrated, resilient, normally flat screen member;

preparing the screening material with a design while the material is attached to the flat border;

determining a curvature suited to printing on a curved surface;

forming a curved platform which comprises the determined curvature;

supporting a curved flexible panel of a cap on the platform;

causing the curved flexible panel on the platform to take a curvature conforming to the platform curvature;

causing the integrated screen member to take a curved configuration defining a curvature which cooperates with the curvature of the platform;

holding the curved screen member over the panel on the platform;

transferring ink through the curved printing screen of the screen member to the flexible panel; and

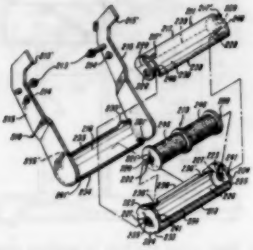
returning the resilient screen member to its normally flat state.

4,478,145

METHOD OF COUPLING INK ROLLER CARTRIDGE USING PIVOTABLE COVER

John D. Mistyurik, Tipp City, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 349,497, Feb. 17, 1982, Pat. No. 4,433,624.
This application Oct. 3, 1983, Ser. No. 538,448
Int. Cl.³ B41F 1/40
U.S. Cl. 101—205 2 Claims



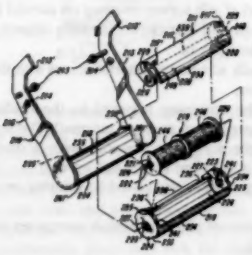
1. Method of coupling an ink cartridge to a carrier which supports the ink cartridge, comprising the steps of: providing a removable cartridge having a first member for rotatably mounting an ink roller and a rotary second member for covering the ink roller, positioning the first member against a carrier, and manually pivoting the second member to a position in which the carrier is captive between the first and second members to couple the cartridge to the carrier.

4,478,146

INK ROLLER SUPPORT WITH PIVOTABLE COVER

John D. Mistyurik, Tipp City, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 349,497, Feb. 17, 1982, Pat. No. 4,433,624.
This application Oct. 3, 1983, Ser. No. 538,716
Int. Cl.³ B41F 1/40
U.S. Cl. 101—205 24 Claims



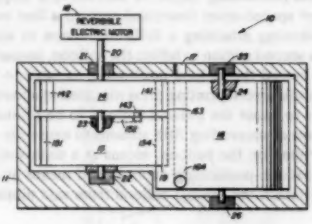
1. An ink cartridge adapted to be connected to a carrier, the ink cartridge comprising: a cover defining a chamber and having an open position and a closed position, the cover including at least two relatively movable cover members, the cover members being movable between open and closed positions relative to each other, an ink roller rotatably mounted in the chamber, the ink roller being capable of inking a printing member when the cover is in the open position, and means providing a gap between the cover members when the cover is in the open position to enable a carrier to be received in the gap and coupled to the ink cartridge.

4,478,147

TRI-ROTOR SAFE AND ARM DEVICE

George N. Hennings; Larry F. Brauer, and Richmond H. Nickles, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1983, Ser. No. 463,178
Int. Cl.³ F42C 15/00, 9/00, 15/40
U.S. Cl. 102—255 9 Claims



1. A safe and arm device for use in an ordnance item having means for generating control and detonation signals, said safe and arm device comprising:

a casing;

a detonator mounted in said casing and responsive to an external detonation signal;

an output wheel mounted in said casing for rotation about a first axis between safe and armed positions, and having an explosive output lead having first and second ends, a first peripheral means for engaging, means for latching, and a first detent slot;

a first detent mounted in said casing and positioned for selective engagement of said first detent slot in said output wheel thereby defining said safe position of said output wheel, said safe position of said output wheel being further defined by said first end of said explosive output lead being spaced from said detonator;

a driven wheel mounted in said casing for rotation about a second axis parallel with and spaced from said first axis, said second axis being located to intersect a line which intersects said first axis and passes through said means for latching if said output wheel is in said safe position, said driven wheel having second peripheral means for engaging selectively positionable for engagement with said first peripheral means for engaging, first lateral means for engaging, and a second detent slot located adjacent said second peripheral means for engaging for selectively receiving said means for latching;

a second detent mounted in said casing and positioned for selective engagement with said second detent slot in said driven wheel, thereby defining a safe position of said driven wheel;

a driver wheel mounted in said casing for coaxial rotation with said driven wheel, said driver wheel having third peripheral means for engaging positionable for engagement with said first peripheral means for engaging, second lateral means for engaging coacting with said first lateral means for engaging to intermittently transfer rotational motion from said driver wheel to said driven wheel, and a third detent slot located adjacent said third peripheral means for engaging for selectively receiving said means for latching;

a third detent mounted in said casing and positioned for selective engagement of said third detent slot in said driver wheel thereby defining a safe position of said driver wheel; and

a reversible driver attached to said driver wheel, said reversible driver imparting rotation to said driver wheel in response to an external control signal;

said safe position of said output wheel being further defined by said first peripheral means for engaging being posi-

tioned out of engagement with said second and third peripheral means for engaging and said means for latching being out of engagement with said second and third detent slots; and

said armed position of said output wheel being defined by said first end of said explosive output lead being positioned adjacent said detonator, said means for latching being positioned away from said second axis, and said first peripheral means for engaging being positioned in engagement with said second and third peripheral means for engaging.

4,478,148

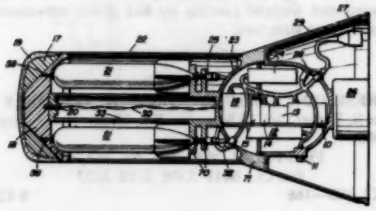
MISSILE DELIVERED EXPLOSIVE SOUND SYSTEM

Albert Applebaum, Silver Spring; Albert S. Will, Bethesda; Samuel A. Humphrey; Frank C. McLean, both of Silver Spring; Sylvan Wolf, Hyattsville; Carl R. Peterson; Harry J. Gauzza, both of Silver Spring, and John C. Hetzler, Laurel, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1963, Ser. No. 334,669

Int. Cl.³ F42B *21/00*

U.S. Cl. 102—390 **10 Claims**



1. An underwater communication system capable of missile delivery for releasing explosive charges in timed sequence comprising;

a main power supply,

decelerometer means,

separation switch means for electrically interconnecting and energizing said decelerometer means and said main power supply upon receipt of an arming signal from said missile,

thermal battery means,

means coupled to said decelerometer means for deploying a parachute and for energizing said thermal battery means,

timer means for releasing said explosive charges in a predetermined sequence, and

means coupled to said thermal battery means for energizing said timer means.

4,478,149

UNDERWATER DETONATING DEVICE

Günter Backstein, Meerbusch; Hans W. Unger, Krefeld; Michael Günther; Dieter Kaltbeitzer, both of Duesseldorf, all of Fed. Rep. of Germany, and Hendrik Veldhoen, Overijse, Belgium, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 190,420, Sep. 24, 1980, Pat. No. 4,369,709. This application Sep. 27, 1982, Ser. No. 424,248

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939711; Sep. 29, 1979, 2939700

Int. Cl.³ F42C *15/40*

U.S. Cl. 102—426 **7 Claims**

1. Control system for sound actuation of ignition devices, comprising:

a digital logic part;

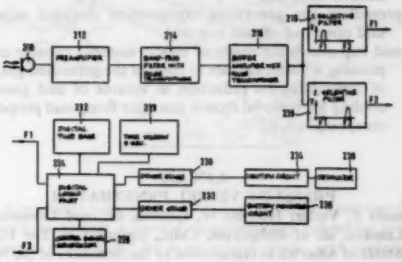
means producing two frequency and time correlated input signals;

an analog pressure wave receiver comprising a hydrophone, a preamplifier connected to said hydrophone, a band-pass filter connected to said preamplifier, a buffer amplifier connected to said band-pass filter, and two parallel selective filters connected to said buffer amplifier and having outputs with logic level for processing in said digital logic part;

said digital logic part connected to said analog pressure wave receiver;

dual driver stages connected to said digital logic part; and

first and second discharge circuits connected in parallel, said first discharge circuit connected to the dual driver stages



and to a detonator and a voltage supply and suitable for selectively igniting the detonator and the second discharge circuit for short circuiting the voltage supply, and wherein said digital logic part activates said first and second discharge circuits in successive time intervals (t_1, t_2, t_3) depending on said means producing two frequency and time correlated input signals; and

said two parallel selective filters comprise in their filter channel in each case in series connection a filter element, an emitter follower and a Schmitt-trigger.

4,478,150

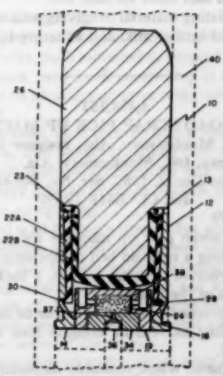
CARTRIDGE WITH ELASTIC PUSHER CUP

William M. Sayler, Bradshaw, and John M. Hayner, Towson, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1983, Ser. No. 457,334

Int. Cl.³ F42B *5/02*

U.S. Cl. 102—430 **1 Claim**



1. In an improved 40 mm ammunition cartridge comprising:

a case including a bore, said bore having an interior surface provided with a groove,

a tubular cup seal disposed in said bore, said cup seal having an outer tubular section and an inner tubular section con-

nected by a single annular fold section circumscribing an area, said inner tubular section having a sidewall and a closed end,

said outer tubular section having an open end including an exterior annular flange disposed in said annular groove, said closed end increasing in thickness towards the center at an angle of about 7° from the juncture with said sidewall,

means for locking said flange in said groove to anchor and seal said cup in said bore;

a 40 mm projectile inserted in said circumscribed area of said annular fold, and

propellant gas generating composition disposed adjacent said open end of said cup seal,

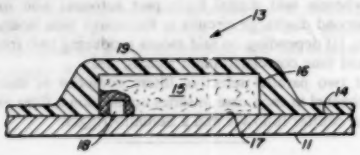
said cup seal being made of elastic material capable of expanding without rupture to contain the generated gas, and of contracting on reduction in volume of said gases on cooling for removal from a gun after firing said propellant composition.

4,478,151

PRESSURE VESSEL PENETRATOR

Ronald F. Vetter; Howard W. Gerrish, Jr., and Lawrence F. Lesniak, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1983, Ser. No. 470,671
Int. Cl.³ F42B *41/00*
U.S. Cl. 102—481 **18 Claims**



1. A pressure hull penetrator for rocket motors comprising:

a rocket motor have a pressure hull with inner and outer surfaces;

a mass of thermite material having a predetermined shape to conform to a selected area of the inner surface of said rocket motor pressure hull;

an igniter compound in contact with said mass of thermite material and said inner surface; and

a layer of insulating material overlying said mass of thermite material, said igniter mix, and adhering to said inner surface.

4,478,152

RAILROAD SCRAP PICK UP MACHINE

John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.

Filed Dec. 2, 1982, Ser. No. 446,413
Int. Cl.³ B61F *19/06*
U.S. Cl. 104—279 **22 Claims**

1. A railroad scrap pick up machine for picking up loose metallic parts along a railroad bed comprising:

(a) a frame structure defining a front, a back, and first and second sides of the machine,

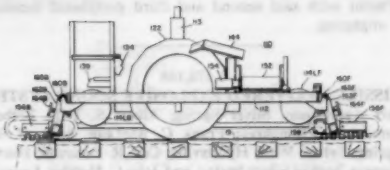
(b) at least two wheels on said first side of said frame structure for rolling movement along at least a first rail on a railroad bed,

(c) a first magnetic wheel rotatably disposed at said second side and mounted to a support beam extending across to said first side, said support beam being secured at a first side pivot point for pivoting in a plane transverse to said first and second sides,

(d) supporting means for keeping said second side of said frame structure above the railroad bed as said at least two wheels roll along the at least one rail and as said first magnetic wheel rolls along in contact with a railroad bed,

(e) a stripper means mounted to said structure,

(f) a storage means mounted to said frame structure adjacent said stripper means and wherein said first magnetic wheel is operative to rotate and pick up metallic parts as said machine is moved along a railroad bed, said stripper



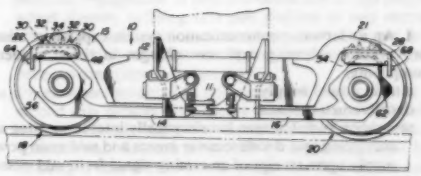
means is operative to remove metallic parts from said first magnetic wheel and deposit the metallic parts on said storage means, and said first magnetic wheel follows peaks and troughs in a railroad bed by moving up and down with said support beam pivoting about said first side pivot point and without causing up and down movements of said frame structure.

4,478,153

RESILIENT STEERING CONTROL ASSEMBLY

Walter S. Eggert, Jr., 26 Moredon Rd., Huntington Valley, Pa. 19006

Filed Feb. 26, 1982, Ser. No. 352,793
Int. Cl.³ B61F *3/08, 5/38, 5/32*
U.S. Cl. 105—168 **8 Claims**



1. In combination with first and second vertically disposed structural bodies responsive to different applied forces to produce relative movement therebetween,

a coupling assembly disposed between said first and second bodies comprising:

(a) means for fixedly mounting said coupling assembly to said first body;

(b) means for movably mounting said coupling assembly to said second body;

(c) relatively low friction means disposed between one of said bodies and said coupling assembly;

(d) said coupling assembly further comprising an elastomeric member to absorb energy and to permit limited movement between said first and second structural bodies when relatively low differential forces are applied thereto and to permit relatively free movement between said first and second structural bodies when relatively high differential forces are applied thereto;

(e) said coupling assembly further comprising an outer metal plate member and an inner metal insert member disposed within and spaced from said outer metal plate member with said elastomeric member being disposed therebetween; and

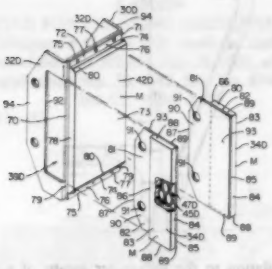
(f) said outer metal including extending portions around said inner metallic insert member to restrict said elastomeric member therebetween.

4,478,154

PEDESTAL LINER FOR RAILWAY VEHICLE AND METHOD OF MAKING SAME

Homer N. Holden, Jackson County, N.C.; Donald L. Kleykamp, Washington Township, Montgomery County, Ohio; William F. Moore, Cherokee Village, Ark., and Julien C. Mathieu, Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 167,292, Jul. 10, 1980, Pat. No. 4,313,384. This application Dec. 14, 1981, Ser. No. 330,629
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.³ B61F 5/32
U.S. Cl. 105—225 20 Claims



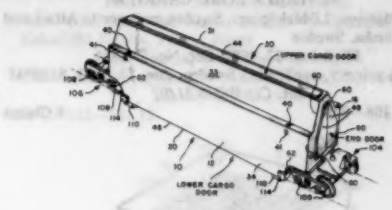
1. In a pedestal liner for a railway vehicle wherein said vehicle comprises: pedestal trucks comprising pairs of pedestal legs; a journal box disposed between each associated pair of pedestal legs; each journal box having a vertically disposed planar guide surface and a pair of spaced vertically disposed parallel side surfaces disposed on opposite sides of said guide surface; said pedestal liner being roughly U-shaped and comprising: a bight and a pair of parallel legs and being adapted to be disposed between an associated pedestal leg and journal box and fastened to the associated pedestal leg; a roughly U-shaped metal support comprising the main structural portion of said liner; said metal support also having a bight and a pair of parallel legs; antifriction polymeric material for said parallel legs of said liner supported by said metal support and adapted to engage said side surfaces; and antifriction polymeric material for said bight of said liner supported by said metal support and adapted to engage said guide surface; said antifriction polymeric material being ultra high molecular weight polymeric material; the improvement in which, said antifriction polymeric material for at least one of said parallel legs of said liner comprises an insert comprised of said antifriction polymeric material and being carried by said metal support, said insert having a roughly parallel member which has an outer portion disposed outwardly of and parallel to one of said parallel legs of said support with said outer portion being adapted to engage the respective said side surface, said parallel member comprising said antifriction polymeric material for said one parallel leg of said liner, said one parallel leg of said support having an opening therethrough adjacent said bight of said support and receiving said insert therein, said insert having holding means extending beyond the edges of said opening for cooperating with said support to hold said insert in said opening.

4,478,155

RAILWAY CONTAINER AND CAR

Lawrence Cena, Naperville, and Ted D. Mason, Glen Ellyn, both of Ill., assignors to Atchison, Topeka and Santa Fe Railway Company, Chicago, Ill.

Filed Dec. 22, 1981, Ser. No. 333,448
Int. Cl.³ B60P 7/13; B61D 3/14; B61F 1/14; B65D 88/32
U.S. Cl. 105—355 33 Claims



1. A container configured to be transported on a railway car of the type having a central, longitudinally extending spine supported at each end by a respective truck, said container comprising:

a housing comprising a peripheral wall, a bottom section secured to a lower edge of the wall, and a top section secured to an upper edge of the wall; and

means for releasably anchoring the container to the car to position the container with respect to the car;

said bottom section defining a raised elongated central section, shaped to overlie the spine of the car when the housing is positioned on the car, and a pair of longitudinally extending skirts, one on each side of the central section, positioned to extend alongside and below the spine between the trucks when the housing is positioned on the car;

said top section defining a central ridge positioned over the central section of the bottom section such that the top section defines a contour which corresponds to that of the bottom section to facilitate stacking of the housing;

said skirts forming a cargo-carrying portion of the container;

said bottom section shaped to clear the spine such that the container can be lowered onto and lifted off of the railway car.

29. The combination of a railway car and container comprising:

a railway car comprising:

a central spine extending in a longitudinal direction;

a pair of trucks, each mounted to support a respective end of the spine, each truck comprising at least two wheels mounted on an axle; said axles being substantially coplanar; and

a pair of bolsters, each secured to the spine near a respective truck, said bolster including two spaced pedestals, each positioned on a respective side of the spine at a point lower than an upper surface of the spine; a cargo container comprising:

a peripheral wall having a lower edge and an upper edge;

a bottom section secured to the lower edge of the peripheral wall, said bottom section defining a longitudinally extending central section above and adjacent the spine and a pair of downwardly extending, cargo carrying skirts, each skirt positioned adjacent a respective side of the spine between the trucks;

a top section secured to the upper edge of the peripheral wall, said top section defining a raised central ridge having a contour corresponding to that of the bottom section; and

four anchor members, each mounted at a respective lower end portion of a respective one of the skirts adjacent a respective one of the pedestals; and

means for releasably fastening each of the anchor members

to the respective pedestal to secure the container to the car;

said bottom section shaped to clear the spine such that the container can be lowered onto and lifted off of the railway car.

4,478,156

NESTABLE LOAD CARRIER

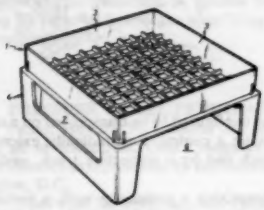
Kjell Andersson, Löddeköpinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jun. 22, 1982, Ser. No. 390,854

Claims priority, application Sweden, Jun. 23, 1981, 8103945

Int. Cl.³ B65D *21/02*

U.S. Cl. 108—53.1 **8 Claims**



1. A nestable load carrier comprising an open-top box member with a bottom and side walls, for transporting and furnishing objects placed on said bottom, the carrier comprising also a frame connected to said bottom and having descending walls terminating in a lower edge surface which is substantially planar and continuous, with two similar opposed recesses in said descending walls, said recesses extending from said lower edge surface substantially up to said bottom and being dimensioned for insertion therein of at least one movable load-supporting member below said bottom, said frame also having two similar opposed windows in said descending walls spaced laterally from said recesses and dimensioned for insertion therein of at least one movable load-supporting member below said bottom, said descending walls defining an inner circumference of the frame which is greater than the outer circumference of said side walls, whereby the frame is adapted to telescopically receive the box member of an identical load carrier, and upwardly-facing first shoulder means located on the outer wall of the load carrier at a level no lower than the upper edges of said windows, said inner circumference exceeding said outer circumference at least through a height from said lower edge surface which corresponds to the distance from said first shoulder means to the upper edge of said side walls, said first shoulder means being operable to abut the lower edge surface of an identical superjacent load carrier into which said box member is telescopically received, said descending walls forming lateral retaining means for substantial embracing and holding together merchandise protruding into the frame and on which said bottom rests, said distance from the shoulder means to the upper edge of the side walls being no greater than the distance from the lower edges of said windows to said lower edge surface of the frame.

4,478,157

MILL RECIRCULATION SYSTEM

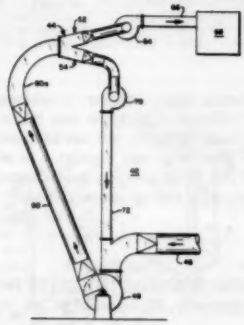
Richard L. Musto, Homewood, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 442,557, Nov. 18, 1982,. This application Dec. 23, 1983, Ser. No. 564,660

Int. Cl.³ F23K *1/00*

U.S. Cl. 110—106 **6 Claims**

1. In a direct fired system operative for purposes of effecting the pulverization and subsequent firing of solid fuels, said direct fired system including pulverizer means for pulverizing solid fuel material, classifier means for rejecting pulverized solid fuel particles that exceed preset specifications for fineness and for returning the rejected oversize particles to the pulverizer means for further pulverization, burner means for firing therewithin properly sized solid fuel particles, and means establishing a fluid flow path for a stream of hot gases and for the pulverized solid fuel particles from the pulverizer means to the classifier means and from the classifier means to the burner means, the improvement comprising classifier means consisting of a classifying elbow, said classifying elbow including a section of duct having a first bifurcation and a second bifurcation, said first bifurcation being connected to the pulverizer means for recirculating the oversize solid fuel particles back to the pulverizer means for further pulverization therewithin along



with a recirculation to the pulverizer means of a portion of stream of hot gases that enters said classifying elbow, said second bifurcation being connected to the burner means for conveying thereto those solid fuel particles that satisfy the preset specifications for fineness along with the remainder of stream of hot gases that enters said classifying elbow, and said classifying elbow further including deflector blade means mounted for movement relative to said section of duct, said deflector blade means being operative to effect the separation of the solid fuel particles received in said classifying elbow into those solid fuel particles that satisfy the preset specifications for fineness and those solid fuel particles that exceed the preset specifications for fineness.

4,478,158

CONDENSING FURNACES

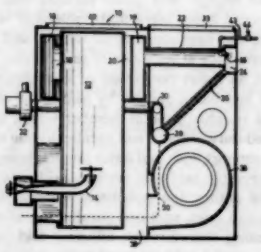
Robert W. Smith, Ontario, Canada, assignor to Eneroll Research Ltd., Downsview, Canada

Filed Apr. 29, 1983, Ser. No. 490,221

Claims priority, application United Kingdom, Oct. 28, 1982, 8230760

Int. Cl.³ F23J *15/00*

U.S. Cl. 110—215 **5 Claims**



1. A condensing furnace, comprising:

a burner means for producing hot gaseous products of combustion,

blower means for moving air through the furnace,

heat exchanger means for transferring heat from said hot gaseous products of combustion to said air,

fin tube condensing means through which the hot gaseous products of combustion are ducted, and past which said air flows,

and means for spraying water into the hot gaseous products of combustion upstream of the fin tube condensing means, so that the sprayed water droplets mix intimately with the hot gaseous products of combustion and are vaporized thereby, whereby a portion of the combined water vapor and gaseous products of combustion can condense in the condensing means to create a liquid condensate of which the pH is closer to neutral than would have been the case in the absence of the sprayed water.

4,478,159

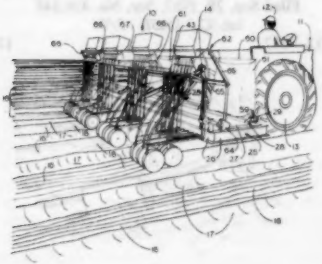
APPARATUS FOR PLANTING SEEDS AND THE LIKE

Raymond Melgoza, P.O. Box 443, Coalinga, Calif. 93210

Continuation of Ser. No. 305,956, Sep. 28, 1981, abandoned. This application Sep. 22, 1983, Ser. No. 534,668

Int. Cl.³ A01C *5/06*

U.S. Cl. 111—52 **9 Claims**



1. Apparatus for simultaneously planting seeds in a plurality of adjacent beds of earth separated by substantially parallel furrows, the apparatus comprising, in combination:

(a) a main frame;

(b) attachment means for mounting the main frame on a vehicle for movement with the vehicle over beds of earth disposed along a path in a predetermined direction of travel substantially parallel to furrows associated with the beds of earth;

(c) a subframe having an axle and an upper portion;

(d) mounting means for attaching the subframe on the main frame with the axle of the subframe being oriented substantially horizontally and transversely of the predetermined direction of travel;

(e) a plurality of arms mounted on the axle of the subframe for independent pivotal movement about the axle thereof in individual, spaced, substantially parallel, planes substantially normal to the associated axle, each of the arms having a horizontal portion pivotally mounted on the axle and a vertical portion disposed in right angular relation to the horizontal portion, the horizontal portion of at least one of the arms being of a length greater than the horizontal portion of at least one of the other of the arms; and

(f) a plurality of planting heads each having a forward portion and a rearward portion relative to the predetermined direction of travel, each of the planting heads being borne by a vertical portion of a respective one of the arms associated with the subframe, attachment of each of the planting heads to the subframe being at a point remote from the horizontal portion of the associated arm and in trailing relation to the axle of the subframe with respect to the predetermined direction of travel, each of the planting heads being arranged for forming a depression in earth being traversed as the respective one of the planting heads is moved in the predetermined direction of travel and in engagement with the earth.

4,478,160

PATTERN SEWING MACHINE

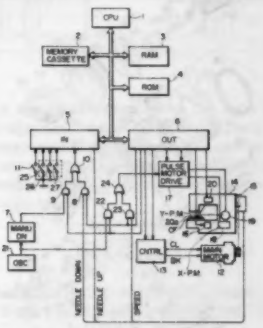
Kohichi Ohniwa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,284

Claims priority, application Japan, Oct. 14, 1981, 56-163887

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.12 **12 Claims**



1. A pattern sewing machine, comprising:

a cloth feeding mechanism driven by at least one first motor;

a sewing machine mechanism having a needle and driven by a second motor;

memory means for storing control data, said control data including pattern data for determining a direction and amount of rotation of said first motor;

temporary stop instruction means for providing a first instruction for stopping said sewing machine mechanism during sewing;

minute movement instruction means for providing a second instruction for moving said cloth feeding mechanism while said sewing machine mechanism is stopped; and

a control circuit for reading said conrol data and for synchronously driving said cloth feeding mechanism and said sewing machine mechanism in accordance with said control data, said control circuit comprising: a first control element responsive to said first instruction for stopping said sewing machine mechanism with said needle at a predetermined position, and for stopping said cloth feeding mechanism; and a second control element responsive to said second instruction for minutely moving said cloth feeding mechanism in accordance with said pattern data from a position where said cloth feeding mechanism has been stopped to a desired position, and for thereafter driving said sewing machine mechanism and cloth feeding mechanism in accordance with said control data.

4,478,161

SWITCHING DEVICE OF A DOUBLE-FUNCTION SEWING MACHINE

Susumu Haayu; Noboru Kasuga, both of Tokyo; Reishi Nomota, Kanagawa, and Yoshikazu Ebata, Tokyo, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 459,622

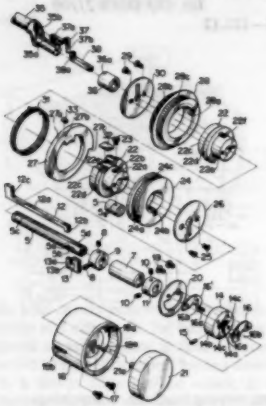
Claims priority, application Japan, Jan. 26, 1982, 57-9594

Int. Cl.³ D05B *1/14*

U.S. Cl. 112—155 **3 Claims**

1. In a double-function sewing machine having a lock stitch

forming mechanism and an overlock stitch forming mechanism, a rotatable flywheel and a machine frame, a switching device for switching the sewing machine for lock stitching or overlock stitching comprising a flywheel shaft rotatably supported in the machine frame; a switching key slidably displaceable with respect to said flywheel shaft lengthwise thereof and having an end connected to the flywheel and rotatable integrally with said flywheel shaft; a belt wheel bush secured to the flywheel shaft; a first belt wheel rotatable by a driving source and operatively connected to said belt wheel bush for rotation thereof; a second belt wheel operatively connected to the overlock stitch mechanism by a belt and rotatably supported on said belt wheel bush; a lock stitching upper shaft



connected to the lock stitching mechanism, said upper shaft being rotatable in the machine frame and arranged coaxial with said flywheel shaft; said switching key being selectively engageable with said belt wheel bush and with said lock stitching upper shaft to connect said belt wheel bush to said lock stitching upper shaft or with said belt wheel bush and with said second belt wheel to connect said belt wheel bush to said second belt wheel; and a switching pawl engageable with said second belt wheel and slidably guided with respect to the machine frame so as to enable the flywheel to be operated between a first position in which the belt wheel bush and the lock stitching upper shaft are connected by said switching key and a second position in which said belt wheel bush and said second belt wheel are connected by said switching key.

4,478,162

NEEDLE GUARD OF A SEWING MACHINE

Gerhard Bierweiler, Bielefeld, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Jun. 3, 1982, Ser. No. 384,583

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122613; Apr. 3, 1982, 3212543

Int. Cl.³ D05B 55/06, 57/08

U.S. Cl. 112—227 **4 Claims**

3. An arrangement in a sewing machine, comprising: a double lockstitch hook with a rotatably mounted hook body, a hook beak and needle guard means having a free end; said needle guard means being attached by screw means to said hook body and supporting screw means for said free end in said hook body and having means for securing said supporting screw means against undesired rotation, said hook body having a hub for receiving said supporting screw means, said supporting screw means received in a threaded hole in said hook body and having a head, said free end of said curved portion of said needle guard means resting against said head, said needle guard means being pretensioned so that said free end rests constantly against said head when said supporting screw means is turned to vary the position of said needle guard means with respect to said beak, said free end and said contact surface being displaced upon turning said supporting screw means to provide substantial clearance between a needle and said beak, said means for securing said supporting screw means comprising a coating for preventing self-turning of said supporting screw means when the sewing machine is in operation, said hook remaining in the sewing machine when adjusting the position of said guard means relative to said beak by turning said supporting screw means; said needle guard contacting said needle in a most close vicinity of the hook beak.

4,478,163

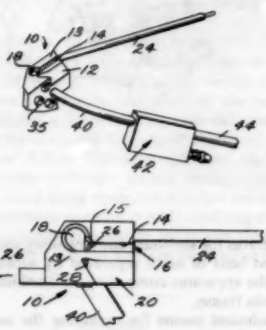
DUAL EXPOSURE HOT WIRE CUTTER

John H. Keeton, P.O. Box 296, Campbellsville, Ky. 42718

Filed Sep. 28, 1982, Ser. No. 426,145

Int. Cl.³ D05B 65/06

U.S. Cl. 112—287 **12 Claims**



1. A cutting assembly for cutting thread, comprising:

a guide block having a bottom surface for movement of cloth therepast in a direction A;

means defining a narrow channel in said guide block substantially parallel to said direction A, said channel being open at said bottom surface, and having a trailing end and a leading end spaced from each other in the direction A;

means defining a vacuum cut-thread removal passageway in said block at said channel leading end, and in operative communication with said channel, said passageway elongated in a dimension intersecting said channel;

a wire portion of electrically conductive material adapted to be connected to a source of e.m.f.; and

means for mounting said wire portion in said channel, spaced from the channel top, so that said wire extends in said channel generally perpendicular to said direction A adjacent, but spaced from, the intersection of said channel and said vacuum passageway, out of the primary flow of air into the vacuum passageway.

8. A cutting assembly for cutting thread comprising:

a guide block having a bottom surface for movement of cloth therepast in a direction A;

means defining a narrow channel in said guide block substantially parallel to said direction A, said channel being open

at said bottom surface, and having a trailing end and a leading end spaced from each other in the direction A;

means defining a vacuum cut-thread removal passageway in said block at said channel leading end, and in operative communication with said channel, said passageway elongated in a dimension intersecting said channel;

means defining a notch in said block adjacent, but spaced from, said channel leading end and said vacuum passageway, said notch including an open bottom and end;

a wire of electrically conductive material adapted to be connected to a source of e.m.f.; and

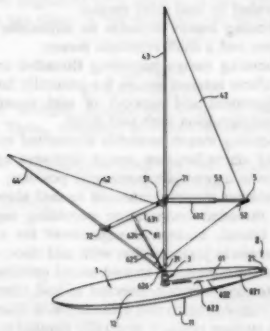
means for mounting said wire in said notch and said channel so that thread in said notch or said channel can be brought into contact with said wire, and severed thereby.

4,478,164

WIND-PROPELLED CRAFT

Michael J. Menear, 14 Lodge Way, Shepperton, Middlesex TW17 ORZ, England

Filed Jul. 13, 1982, Ser. No. 397,947
Int. Cl.³ B63H *9/04*; B63B *39/00*
U.S. Cl. 114—39 **13 Claims**



10. A wind-propelled craft comprising:

(a) a hull and a pair of unstayed masts mounted on the hull to pivot about an axis lying in an approximately horizontal plane,

(b) said pair of masts being pivotal between a first position in which one mast extends substantially vertically and the other extends generally at right angles thereto away from the hull and a second position in which the relative configuration of the masts is reversed,

(c) each mast including a sail structure selected from the group consisting of sails and aerofoils whereby a first sail structure can be trimmed to the wind to provide forward propulsion while the other sail structure simultaneously provides upward lift tending to counteract rolling or heeling force applied to the hull by wind impinging on the first sail structure, and

(d) means for connecting the masts at an angle with respect to each other with cross-struts located at the leading and trailing edges of said sail structures.

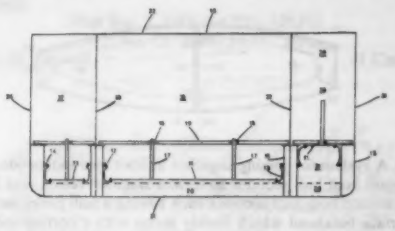
4,478,165

BALLAST-CARGO GRID SYSTEM FOR TANKERS

Patrick J. Strain, 27 Tanglewood Dr., Nepean, Ontario, Canada (K2H 6P5)

Continuation-in-part of Ser. No. 234,135, Feb. 13, 1981, abandoned. This application Mar. 18, 1983, Ser. No. 476,665
Claims priority, application Canada, Apr. 11, 1980, 347444
Int. Cl.³ B63B *25/12*
U.S. Cl. 114—74 R **6 Claims**

1. A ballast-cargo grid system for a tanker or the like comprising, within the length of the cargo space of the hull of the tanker, a plurality of narrow ballast tanks generally following the contours of the ship's sides and of the main longitudinal and transverse bulkheads, to form a grid pattern of rectangular or square vertical hollow cells with straight smooth sides of a height generally reaching from the ship's bottom up to half of the cargo space height, wherein each individual cell contains



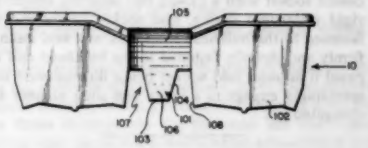
therewithin a segregation partition in the form of diaphragm means, cargo space of the hull being divided into a plurality of individual cargo spaces, and wherein the narrow ballast tanks also extend crosswise and lengthwise through individual cargo spaces to further subdivide such cargo spaces into smaller individual cargo spaces.

4,478,166

BOAT

George C. Sorensen, 9812 17th Ave. SW., Seattle, Wash. 98106

Filed Dec. 22, 1980, Ser. No. 219,338
Int. Cl.³ B63B *1/20*
U.S. Cl. 114—290 **2 Claims**



1. A boat capable of supporting an outboard motor having a propeller and a cavitation plate comprising at least one transom to support the motor, a skeg aligned under the center of the transom and extending forward over at least a portion of the boat's length, and hulls arranged substantially parallel to the skeg, extending downwardly from the transom's bottom and defining with the skeg and transom two channels along the boat's bottom wherein:

(a) the skeg is symmetrical about the longitudinal centerline of the boat and has a substantially trapezoidal cross-section having only three, substantially planar, wetted surfaces, the surfaces forming a base and two sides of the skeg, each surface being substantially a single plane lacking discontinuities, wherein the area of the trapezoidal skeg uniformly increases as the skeg runs aftward so that at its aft end, the skeg sustantially shields the propeller to reduce cavitation, the aft end of the skeg extends downwardly from the bottom of the transom to a depth corresponding approximately to that of the cavitation plate of the motor supported from the transom, and the base of the skeg defines as additional planing surface for the boat; and

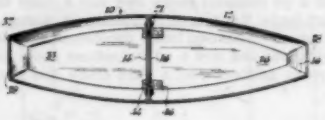
(b) the channels substantially uniformly decrease in cross-sectional area to increase the apparent water pressure and velocity in each channel, resulting in an increase in lift of the boat's stern and a further reduction in cavitation of the propeller, wherein the area of each channel uniformly decreases by about 20% from the area at its reference inlet for each foot of travel aftward, and wherein the hulls extend downwardly at least as far as the depth reached by the aft end of the skeg.

4,478,167

COUPLING SYSTEM FOR A MULTIPLE SECTIONED BOAT

Kevin G. Hart, 35 Ocean Ave., Harwich Port, Mass. 02646

Filed May 4, 1981, Ser. No. 260,314
Int. Cl.³ B63B 7/04
U.S. Cl. 114—352 1 Claim



1. A system for joining together at least two independently buoyant boat hull sections to form a singular vessel, said first and second boat hull sections each having a hull panel and an interface bulkhead which flushly mates with a corresponding interface bulkhead in an adjacent hull section to be attached, the system for joining said boat hull sections comprising:

at least one threaded fastening means which is mountable through the upper areas of said first and second interface bulkheads for positive clamping together of said first and second bulkheads above the waterline, said first and second interface bulkheads having alignable passages which are coaxial when the first and second hull sections are joined and receive the fastening means;

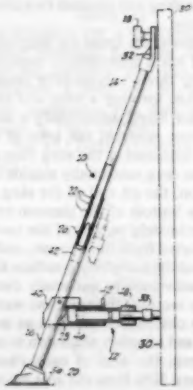
at least one rigid elongated pin which resists flection along the interface, said rigid elongated pin being anchored near the waterline, and being mounted through said first bulkhead and embedded in a rigid watertight block firmly and directly attached to the bulkhead and the hull panel it adjoins; said second bulkhead having a watertight recessed socket with a closed end securely embedded in a rigid watertight casing, said socket firmly and directly fastened to the bulkhead it adjoins, and said casing being firmly and directly fastened to the bulkhead and the hull panel it adjoins; said socket being dimensioned to correspondingly engage in a ready and snug manner and said elongated pin.

4,478,168

DOOR BRACE AND ALARM DEVICE

Robert C. Wimmer, 3337 SW. 7th St., Ocala, Fla. 32674

Filed Jul. 23, 1982, Ser. No. 401,230
Int. Cl.³ G08D 13/08
U.S. Cl. 116—82 4 Claims



1. A door brace alarm apparatus, comprising:

an alarm means for producing a warning sound when the door is moved relative to the generally horizontal floor;

a shaft means positionable at an angle from a generally vertical door to a generally horizontal floor for providing resistance to attempted movement of said door and for providing support for said alarm means, said shaft means having two ends, said shaft means including a horizontal connection means connected to said ends for connection to said door and said floor;

said alarm means including a triggering means for triggering said alarm means;

said alarm means connected to said shaft means to position said triggering means for producing a warning sound when the door is moved relative to the generally horizontal floor in opposition to the resistance supplied by said shaft means;

said alarm means comprise an alarm housing means and a sound emitting means;

said alarm housing means connected to said shaft means for providing support to the sound emitting means in juxtaposition to said door;

said sound emitting means connected to said alarm housing means in juxtaposition to said door for providing a sound upon movement of said door in opposition to the resistance provided by said shaft means;

said alarm houing means includes an adjustable alarm retainer means and a shaft retention means;

said alarm housing means providing threaded cooperation with said alarm retainer means for generally lateral, horizontal adjustment and support of said sound emitting means in juxtaposition with said door;

said alarm housing means rotatably connected to said shaft means, said alarm housing means impinges against said shaft means in a generally horizontal position;

said alarm retainer means connected to said alarm housing means in threaded cooperation providing support and generally lateral, horizontal adjustment for said sound emitting means in juxtaposition with said door, said alarm retainer means connected to said sound emitting means;

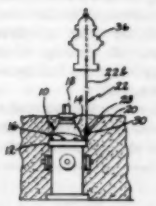
said shaft retention means connected to said alarm housing means for connecting to and retaining said alarm housing means in a storage position generally parallel to said shaft means.

4,478,169

MARKING DEVICE FOR FIRE HYDRANT OR THE LIKE

Kenneth D. Shrefler, 967 Lander Rd., Mayfield Village, Ohio 44143

Filed Jun. 13, 1983, Ser. No. 503,568
Int. Cl.³ G09F 17/00; F16M 13/02
U.S. Cl. 116—209 9 Claims



1. A marking device for a fire hydrant or the like comprising, means for mounting the device on the hydrant, elongated stem means connected to said mounting means and projecting a predetermined distance upwardly from said mounting means, and means providing for pivoting of said stem means relative to said mounting means whereby said stem means can be moved from an upwardly extending position to a lowered position and below the plane of the operating nut of the hy-

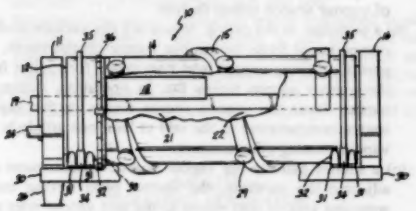
drant, and wherein said mounting means comprises a generally L-shape, in side elevation, bracket having means on the horizontal leg of the bracket for attaching the marking device to the hydrant, and said stem means on the lower end thereof has an inverted generally U-shaped, in side elevation, bracket secured thereto and encompassing a portion of the upwardly extending leg of said L-shaped bracket, said upwardly extending leg having an elongated vertically extending slot therein and said inverted U-shaped bracket having a pin extending transversely thereof through said slot, said U-shaped bracket, said slot and said pin comprising said pivoting means, said pin being disposed adjacent the lower ends of the arms of the U-shaped bracket, and said upwardly extending leg having a shoulder projection on each side thereof at the upper end thereof comprising restraining means, which in conjunction with said pin extending through said slot adjacent the lower end of said U-shaped bracket prevents pivotal movement of said stem means with respect to said mounting bracket in said upwardly extending position of said stem means and unless said inverted U-shaped bracket and attached stem is moved upwardly relative to said slot so as to clear said shoulder projections at the upper end of said upwardly extending leg whereupon said inverted U-shaped bracket and attached stem can then be pivoted relative to said mounting bracket to move said stem means angularly with respect to said mounting bracket and below the plane of the operating nut on a hydrant.

4,478,170

SPRAY GRAINER

William G. Bridges, Athens, and Craig A. Foster, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 5, 1983, Ser. No. 510,691
Int. Cl.³ B05B *15/00*
U.S. Cl. 118—64 **19 Claims**



1. In an elongate, hollow drum having an arcuate interior for forming spray grained particles, the particles accumulating in a bed at the bottom of the drum, the drum being rotatably mounted on support means and having a first end and an opposing second end, the first end and opposing second end lying along the longitudinal axis of the drum, the drum being rotatable about the longitudinal axis, comprising in combination:

a. feed inlet means adjacent the first end for feeding seed particles and product fines into the drum;

b. spraying means positioned within the drum adjacent the first end for spraying the slurry in a predetermined slurry spray pattern thereby defining at least one spraying zone within the drum intermediate the first end and the opposing second end;

c. drying means for introducing a heated gas into the drum for drying the spray grained particles;

d. deflector means extending only in the at least one spraying zone to deflect falling seed particles, product fines and spray grained particles overlying the spraying means and thereby defining the upper limit of the spraying zone;

e. at least one drying zone intermediate the spraying zone and the opposing second end where spray grained particles fall in a substantially uninterrupted downward path through the heated gas; and

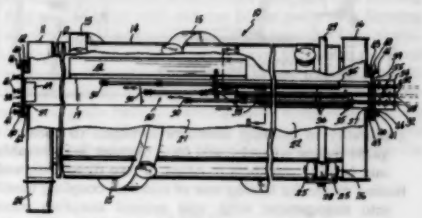
f. spray grained product particle outlet means for removing the product particles from the drum.

4,478,171

VARIABLY DISPLACEABLE SPRAY NOZZLES

William G. Bridges, Athens, and Craig A. Foster, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 2, 1983, Ser. No. 528,811
Int. Cl.³ B05B *15/00*
U.S. Cl. 118—64 **41 Claims**



1. In an elongate, hollow drum having an arcuate interior for forming spray grained particles, the particles being sprayed by a liquid slurry while falling in a cascade, the sprayed particles accumulating in a bed at the bottom of the drum, the drum being rotatably mounted on support means and having a first end and an opposing second end, the first end and opposing second end lying along the longitudinal axis of the drum, the drum being rotatable about the longitudinal axis, comprising in combination:

a. feed inlet means for feeding said particles and product fines into the first end of the drum;

b. support means positioned at least partially within the drum;

c. spraying means supported by the support means for spraying the slurry in a predetermined slurry spray dispersion pattern thereby defining at least one spraying zone within the drum intermediate the first end and the opposing second end, the spraying means being adjustable at least in a first direction parallel to the longitudinal axis of the drum and in a second direction transverse to the longitudinal axis of the drum;

d. drying means for introducing a heated gas into the drum for drying the spray grained particles;

e. at least one drying zone intermediate the spraying zone and the opposing second end where spray grained particles fall in a downward path through the heated gas; and

f. spray grained product particle outlet means adjacent the first end of the drum for removing the product particles from the drum.

4,478,172

CHANGEABLE LIQUID RESERVOIR AND STIRRER APPARATUS

Merle E. Hertzler, Berks County, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,390
Int. Cl.³ B05C *1/02*
U.S. Cl. 118—612 **3 Claims**

1. A changeable liquid reservoir and stirrer apparatus for providing liquid to a liquid applicator comprising:

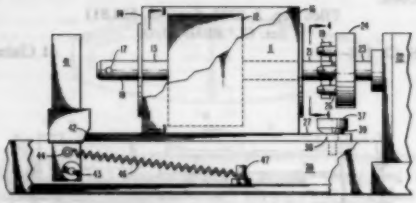
a reservoir for holding a supply of liquid;

a hollow drum rotatably supported in said reservoir, including a plurality of liquid stirring baffles arranged on the inside surface of said drum, said drum including a shaft having a first coupling member in the proximity of each end;

means for rotating said shaft, said means for rotating includ-

ing a second coupling member for engaging one of said first coupling members whereby said shaft is selectively engageable from either end;

a base member for supporting said reservoir in the proximity of said liquid applicator, said base member including a plurality of guide means symmetrically disposed with respect to both ends of the shaft;



a plurality of holding members arranged to receive said guide means whereby said base member is receivable by said holding members in either of two directions; and

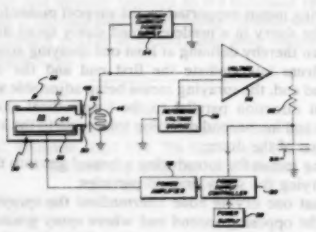
biasing means for biasing one of said first coupling members into engagement with said second coupling member whereby said drum is rotatable in said liquid and said baffles stir said liquid.

4,478,173

METHOD AND APPARATUS FOR SENSING AND CONTROLLING THE INTENSITY OF ENERGY IN A DEPOSITION SYSTEM

Joachim Doehler, Union Lake, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 18, 1983, Ser. No. 486,136
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—688 **3 Claims**



1. In a plasma glow discharge deposition apparatus which is adapted to deposit a layer of semiconductor material upon a substrate, said apparatus including: at least one vacuum chamber; reaction gases adapted for introduction into said chamber; an electrode operatively disposed within said chamber in spaced relation to said substrate; a power supply coupled to said electrode for providing electromagnetic energy to the electrode so as to (1) form a plasma for decomposing the reaction gases in a decomposition region which is formed between the electrode and the substrate, and (2) deposit the layer of semiconductor material onto the substrate; the improvement comprising in combination:

a photosensor operatively disposed to (1) receive illumination emanating from the plasma and (2) generate an output signal correlatable with the intensity of the illumination;

a reference signal source independent of the photosensor, said source adapted to provide a preselected reference signal, whereby said reference signal is independent of the intensity of illumination from the plasma;

comparator means adapted to compare the output signal of the photosensor with the reference signal and generate a control signal indicative of the difference between said output and reference signals, and

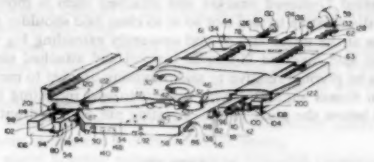
power supply control means adapted to (1) receive the control signal and (2) adjust the intensity of power delivered by the power supply in response to the control signal, whereby the electromagnetic energy actually delivered to the plasma from the electrode may be maintained at a preselected level.

4,478,174

VACUUM COATING VESSEL WITH MOVABLE SHUTTER PLATE

Martial Ranger, Gloucester, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Feb. 15, 1984, Ser. No. 580,229
Claims priority, application Canada, Feb. 25, 1983, 422458
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—718 **4 Claims**



1. A vacuum coating vessel, comprising:

(a) a casing having a vacuum coating compartment and a vapour source compartment, the casing having an outlet for connection to a vacuum source, the vacuum coating compartment having access means thereto for at least one article to be vacuum coated therein, the vapour source compartment having access means thereto for placement of vapour source means therein,

(b) a partition, in the casing, separating the vacuum coating compartment from the vapour source compartment, the partition having vapour inlet port means for vapour from the vapour source means for, in operation, delivering vapour from the vapour source means in the vapour source compartment to the said at least one article in the vapour coating compartment,

(c) a shutter plate in the vapour source compartment and adjacent the partition, the shutter plate having corresponding vapour port means to the said vapour inlet port means and 'O'-ring seal groove means adjacent the partition and bounding at least one closed portion of the shutter plate so that

(i) when the shutter plate is in an open position the vapour port means is aligned with the vapour inlet port means in the partition, for the passage of vapour through the vapour inlet port means while masking, from the vapour, the side of the partition adjacent the shutter plate, and

(ii) when the shutter plate is in a closed position the 'O'-ring seal groove means is aligned with the vapour inlet port means in the partition, for closing the vapour inlet port means,

(d) at least one 'O'-ring seal in the 'O'-ring seal groove means for sealing the closed portion of the shutter plate to the partition in the open and in the closed positions,

(e) bearing means slidably mounting opposed edge portions of the shutter plate in the vapour source compartment, for first disengaging the said at least one 'O'-ring seal from the partition, by moving the shutter plate away from the partition, then guiding the shutter plate from the open to the closed position, and then reengaging the said at least one 'O'-ring seal with the partition, and vice versa, and

(f) means for moving the shutter plate from the open position to the closed position, and vice versa.

4,478,175
REARING UNIT

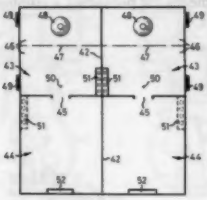
John Fisher, Northwich, and David Holman, Nantwich, both of England, assignors to BP Nutrition (UK) Limited, Essex, England

Continuation of Ser. No. 338,296, Jan. 11, 1982,. This application Nov. 10, 1983, Ser. No. 550,982

Claims priority, application United Kingdom, Jan. 14, 1981, 8101044; Jun. 30, 1981, 8120157; Aug. 21, 1981, 8125548

Int. Cl.³ A01K *1/02*

U.S. Cl. 119—16 7 Claims



1. A rearing unit, suitable for piglets, comprising:
a pen having a perforated floor;
a liquid feeding device in said pen having at least one artificial nipple;
a multi-walled nest box adjacent said pen, said nest box having side walls, a top wall and a floor and having an opening in a side wall thereof permitting passage of an animal between the nest box and the pen, said top wall forming an openable roof;
a heater connected with said nest box for maintaining a minimum temperature within said nest box;
a thermostat having a temperature sensor positioned in said nest box adjacent to said opening in said side wall and connected to said heater for controlling said heater and thereby controlling the temperature in said nest box; and
a solids feed device in one of said pen and said nest box and accessible to an animal in said one of said pen and said nest box.

4,478,176
SPRAYING APPARATUS

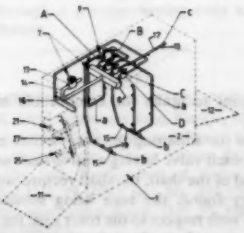
Ian W. James, 50 Hemans St., Cambridge, New Zealand

Filed Sep. 22, 1982, Ser. No. 421,433

Claims priority, application United Kingdom, Sep. 22, 1981, 8128560

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—159 2 Claims



1. Apparatus for spraying animals comprising a race, having sides and a base including a walkway, means of entry to and exit from the race, spraying means within the race arranged to disperse treatment solution into the interiors of the race, a first pair of inwardly extending guide rails mounted on opposite walls of the race in the region of the lower portion of the sides of the race, a second pair of inwardly directed guide rails mounted on opposite walls of the sides of the apparatus below the said first pair of guide rails, each pair of guide rails extending substantially throughout the length of the sides of the apparatus and the second pair of guide rails extending into the interiors of the apparatus to a greater extent than the first pair of guide rails such that the accessible width of the race near the feet of the animal passing through the race is less than the accessible width of the race near the body of such animal, each of said guide rails at each side of the race supporting an elongate retaining panel comprising a shield with mounting brackets extending vertically between one of the guide rails forming said first pair of guide rails and one of the guide rails forming said second pair of guide rails and from one side of the shield, such being adapted to be engaged over the guide rails and locking means, at least equal in length to said mounting brackets, for temporarily locking the mounting brackets with respect to the guide rails, the arrangement being such that the gap between the guide rails is taken up by said retaining panel to prevent small animals from stepping or falling between the guide rails of the race.

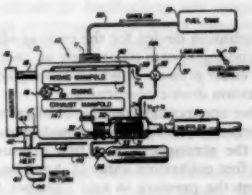
4,478,177
INTERNAL COMBUSTION ENGINE

Joseph M. Valdespino, 5023 Golf Club Pkwy., Orlando, Fla. 32808

Continuation-in-part of Ser. No. 164,038, Jun. 30, 1980, abandoned. This application Dec. 13, 1982, Ser. No. 449,517

Int. Cl.³ F02B *43/08*

U.S. Cl. 123—1 A 8 Claims



1. An improvement in internal combustion engines characterized by:
an internal combustion engine having fuel feed means for feeding a hydrocarbon fuel-air mixture to at least one combustion chamber, said engine having an ignition system and an exhaust system for feeding exhaust gases from said internal combustion engine and a cooling system for cooling said engine;
ammonia storage means for storing ammonia in proximity to said internal combustion engine;
ammonia feed means for feeding ammonia from said ammonia storage means to said engine combustion chamber with said fuel-air mixture charge;
means coupled to said ammonia feed means between said ammonia storage means and said internal combustion engine for dissociating said ammonia into hydrogen and nitrogen and feeding said gas to said engine with the hydrocarbon fuel-air mixture, whereby ammonia is fed into a combustion chamber substantially dissociated;
feed control valve means connected to said ammonia feed means for varying rate of feed of said ammonia to said combustion chamber responsive to operating conditions of said internal combustion engine;
means to control the hydrocarbon fuel-air mixture of said internal combustion engine so as to be leaned below a normal hydrocarbon fuel-air operating range when ammonia is being dissociated and fed from said ammonia storage means by said ammonia feed means to said internal combustion engine in accordance with said rate of feed of said ammonia; and

means to switch said internal combustion engine to said normal hydrocarbon fuel-air operating range in response to said ammonia dissociation means having insufficient heat to dissociate the ammonia; and

means to advance the ignition system spark upon the hydrocarbon air-fuel being leaned by said engine control means and to retard the ignition system spark upon said hydrocarbon air-fuel being switched to said normal hydrocarbon fuel-air operating range.

4,478,178

PRESSURIZATION DEVICE FOR THE COOLING SYSTEM OF A HEAT ENGINE

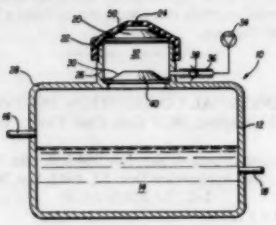
Jean-Paul Pernet, Chassieu, France, assignor to Renault Vehicules Industriels, Boulogne-Billancourt, France

Filed May 12, 1983, Ser. No. 493,814

Claims priority, application France, Jul. 8, 1982, 82 11977

Int. Cl.³ F01P *11/02*; B65D *51/16*

U.S. Cl. 123—41.01 **4 Claims**



1. A pressurization device for the cooling system of a heat engine, said cooling system comprising an enclosure fed by a source of gas under pressure in which cooling liquid circulates, said pressurization device comprising:

(a) a chamber connected to the source of gas under pressure;

(b) a first pressure relief valve disposed between said chamber and the atmosphere, said first pressure relief valve having a first calibration value (T_1) and being oriented so as to vent the pressure in said chamber to atmosphere when it exceeds a predetermined value (P_0+T_1);

(c) a second pressure relief valve disposed between said chamber and the enclosure, said second pressure relief valve having a second calibration value (T_2) and being oriented so as to vent the pressure in said enclosure to said chamber when it exceeds the pressure in said chamber; and

(d) a first depression valve disposed between said chamber and the enclosure, said first depression valve having a third calibraton value (T_3) and being oriented so as to vent the pressure in said chamber to the enclosure when it exceeds the pressure in the enclosure.

4,478,179

RADIAL PISTON ENGINES

Ronald D. Morrison, Edmonton, Canada, assignor to Morrison Motor Corporation, Edmonton, Canada

Filed Dec. 7, 1983, Ser. No. 558,831

Int. Cl.³ F02R *57/08*

U.S. Cl. 123—44 B **9 Claims**

1. In combination:

stationary frame means,

a stationary sun gear on the frame means,

a rotor pivoted about the axis of the sun gear,

the rotor carrying three crankshafts at substantially 120° intervals, each having an eccentric portion,

for each crankshaft a cylinder in the rotor, a piston mounted for reciprocation in each cylinder, and a connecting rod from the piston to the eccentric portion of the crankshaft,

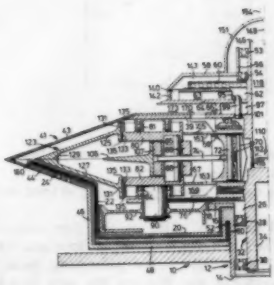
each crankshaft being fixed to rotate with a respective planetary gear, all planetary gears meshing with the sun gear and having the same pitch diameter as the sun gear, whereby any point on the pitch circle of a planetary gear describes a cardioid as the planetary gear rotates around the sun gear once,

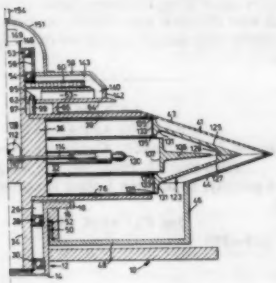
the crankshaft eccentricity being substantially ½ of the pitch radius of a planetary gear,

said eccentric portion of each crankshaft having roller means rotatable about the same axis as the connection between the connecting rod and the eccentric portion,

a ring member having an internal surface surrounding and contacting all of the roller means simultaneously, the ring member being free to rotate about its own axis,

fuel metering means for providing a combustible mixture for the cylinders,





ignition means to ignite the combustible mixture in each cylinder,

three valves for admitting the combustible mixture to each cylinder, each valve having a valve shaft and a valve head at one end of the shaft, the shaft reciprocating in a bore of the rotary frame, the bore being substantially radially arranged with respect to the rotor axis, the shaft having at its end remote from the valve head a roller adapted to contact said internal surface of the ring member over a fraction of each rotor revolution, thereby to depress the valve for the admission of said combustible mixture,

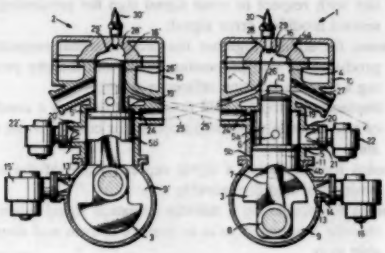
and porting means for exhausting products of combustion from each cylinder.

4,478,180

CRANKCHAMBER PRECOMPRESSION TYPE TWO-CYCLE INTERNAL COMBUSTION ENGINE

Tetsuzo Fujikawa, Kobe, and Toshiyuki Takada, Miki, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 16, 1983, Ser. No. 466,780
Claims priority, application Japan, Feb. 19, 1982, 57-26386
Int. Cl.³ F02B *33/04, 33/14*
U.S. Cl. 123—59 BS 1 Claim



1. A crankchamber precompression type two-cycle internal combustion engine comprising:

cylinder assemblies of an even number consisting of at least one pair of cylinder assemblies having working cycles with 180 phase difference, each cylinder assembly comprising:

a stepped cylinder constituted by a minor diameter cylinder portion and a major diameter cylinder portion;

a stepped piston received in said stepped cylinder and constituted by a minor diameter piston portion and a major diameter piston portion, said minor diameter and major diameter piston portions being in sliding engagement with the minor diameter and the major diameter cylinder portions of said stepped cylinder respectively;

a sub-intake chamber defined between the major diameter portion of said cylinder and the minor diameter portion of said piston, said sub-intake chamber being connected to an auxiliary carburetor and an auxiliary scavenging nozzle oriented toward a combustion chamber of the other associated cylinder assembly; and

a crankchamber connected to said major diameter portion of said cylinder, and connected to a main carburetor and a scavenging passageway oriented toward a combustion chamber of said cylinder assembly;

wherein the improvement resides in that the auxiliary carburetors and the main carburetors are set beforehand in such a manner that the former form a mixture of fuel of high quality and air and the latter from a mixture of fuel of low quality and air, and said sub-intake chamber is in communication with said scavenging nozzle of the associated cylinder through a passage having only a check valve mounted therein.

4,478,181

AFTER GLOW CONTROL SYSTEM FOR ENGINE

Tetsuro Kikuchi, Aichi; Masanori Kato, Kariya; Masahiko Kato; Kazutaka Kato, both of Okazaki, and Tomio Kumoi, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Oct. 27, 1982, Ser. No. 437,171
Claims priority, application Japan, Oct. 27, 1981, 56-171604; Sep. 21, 1982, 57-165772
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—145 A 16 Claims

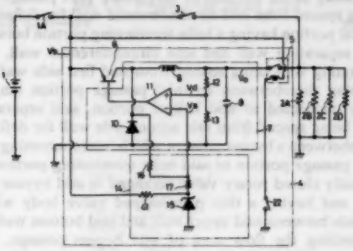
1. An after glow control system for applying a voltage to glow plugs installed in an engine of a vehicle, comprising:

a battery mounted on said vehicle;

a plurality of glow plugs provided in combustion chambers of said engine;

a first electric path for connecting said battery and said glow plugs through a switch;

a second electric path which is connected to said first electic path in parallel, for connecting said battery and said glow plugs through a voltage dropping circuit of which operation starts when said first electric path is cut off and stops when the engine temperature reaches a predetermined temperature;



said voltage dropping circuit being composed of a switching means provided between said battery and said glow plugs, a switching control circuit for controlling the opening and closing period of said switch and a set voltage generating circuit for generating a set voltage;

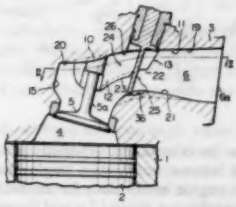
said switching control circuit being composed of an output feedback circuit for feedbacking said output voltage of said voltage dropping circuit, and a comparator for comparing said feed-backed output voltage with said set voltage to apply an electric signal to said switch.

4,478,182

HELICALLY-SHAPED INTAKE PORT OF AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakanishi; Takeshi Okumura; Mutsumi Kanda; Takeshi Kotani, all of Susono, and Tokuta Inoue, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 2, 1983, Ser. No. 490,339
Claims priority, application Japan, May 11, 1982, 57-077477; Jun. 21, 1982, 57-105470
Int. Cl.³ F02F *1/42*
U.S. Cl. 123—188 M 20 Claims



1. An intake device of an internal combustion engine comprising:

an intake valve having a valve stem;

an axially extending intake port passage having an inlet opening at one end thereof and having an outlet opening at the other end thereof, said intake port passage having a substantially cylindrically extending circumferential wall which circumferentially extends about said valve stem, a first side wall which extends between said inlet opening

and said circumferential wall along an axis of said intake port passage, a second side wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage and is arranged to face said first side wall, an upper wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage, and a bottom wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage;

a separating wall projecting downward from said upper wall and spaced from said bottom wall, said separating wall extending along the axis of said intake port passage and being spaced from said circumferential wall for defining a helical portion having a helix terminating portion between said separating wall and said circumferential wall, said separating wall being spaced from said first side wall for defining therebetween an inlet passage portion tangentially connected to said helical portion, said separating wall being spaced from said second side wall for defining therebetween a bypass passage which interconnecting said inlet passage portion to said helix terminating portion;

a normally closed rotary valve arranged in said bypass passage and having a thin plate-shaped valve body which extends between said upper wall and said bottom wall for controlling the flow area of said bypass passage, said bottom wall having a groove formed thereon, said valve body having a lower end which is located in said groove; and

an actuating means for actuating said rotary valve in response to the change in the operating condition of the engine to open said rotary valve when the engine is operating at a high speed under a heavy load.

4,478,183

IDLING SPEED CONTROL FOR INTERNAL COMBUSTION ENGINES

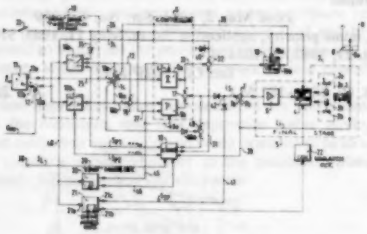
Wolfgang Misch, Wiehl; Adolf Freytag, Neuss, and Manfred Henning, Kaarst, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,399

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1981, 3142360

Int. Cl.³ F02M 3/00

U.S. Cl. 123—339 **13 Claims**



1. Apparatus for controlling, especially in idling, the speed of a vehicular internal combustion engine having a throttle imposed in an engine intake duct for controlling the engine speed, and an accelerator control for said throttle actuatable by a vehicle driver, comprising:

means for producing a signal representative of actual engine speed;

means for producing a reference idling speed signal;

means for comparing said actual engine speed signal with said reference idling speed signal to produce a first error signal;

means for modifying said first error signal by blocking out any portion thereof corresponding to deviation of actual speed from said reference idling speed which is equal to or less than a predetermined extent of deviation and thereby providing a first modified error signal;

means for modifying said first modified error signal by adding at least one other signal thereto including a signal proportional to said signal representative of engine speed, and thereby producing a second modified error signal;

means including a proportional amplifier of unsymmetrical amplification with respect to error signal sign for processing said first modified error signal;

means including an integrator of unsymmetrical characteristics with respect to error signal sign for processing said second modified error signal;

means for adding together the process signal respectively produced by said processing means and thereby producing a throttle position reference signal;

a displaceable stop for said throttle for defining a condition of said throttle when said accelerator control is not actuated.

means for producing a signal representative of the actual position of said displaceable stop;

means for producing a throttle actuation signal when said throttle is actuated so as to remove it from said displaceable stop;

means for comparing said signal representative of actual position of said displaceable stop with said position reference signal provided by said means for adding the signals produced by said processing means, and thereby producing a final error signal;

means for displacing said stop in accordance with said final error signal;

means for disabling said displacing means responsive to said throttle switch signal, and

means for disabling said means for processing said first modified error signal in response to said throttle switch signal.

6. Method of controlling, especially in idling, the speed of a vehicular internal combustion engine having a throttle disposed in an engine intake duct, for controlling engine speed, and an accelerator control for said throttle actuatable by a vehicle driver, said method being automatically operated by means of a displaceable stop for adjusting the idling setting of said throttle during particular conditions of operation of said engine, said method comprising the steps of:

comparing a signal representative of actual engine speed (U_n) with a reference idling speed signal (U_{ns}) to produce a first error signal;

modifying said first error signal by blocking out any portion thereof corresponding to deviation of actual speed from said reference idling speed which is equal to or less than a predetermined extent of deviation to provide a first modified error signal;

modifying said first modified error signal by adding a further contribution thereto including at least a signal proportional to said signal representative of engine speed to produce a second modified error signal;

processing said first modified error signal by a proportional amplifier of unsymmetrical amplification with respect to error signal sign;

processing said second modified error signal by an integrator amplifier of unsymmetrical characteristic with respect to error signal sign;

adding the processed first and second modified first error signals to produce a reference position signal (L_s) for said displaceable stop; and

comparing a signal (L_i) representative of actual position of said displaceable stop with said reference position signal (L_s) to produce a final error signal, and

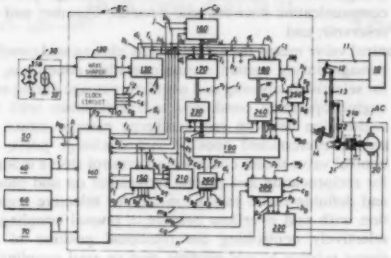
displacing said stop in accordance with said final error signal.

4,478,184

SPEED CONTROL SYSTEM AND METHOD FOR AUTOMOTIVE VEHICLES

Yoshio Shineda, Aichi, and Akira Kuno, Oobu, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 10, 1983, Ser. No. 465,459
Claims priority, application Japan, Feb. 15, 1982, 57-23479
Int. Cl.³ B60K 31/00; F02D 11/10
U.S. Cl. 123—352 9 Claims



1. A speed control system for an automotive vehicle driven by a prime mover under control of control means for controlling the fuel supply into said engine, the control system comprising:

first means for producing a speed signal indicative of the actual speed of the vehicle;

second means for producing a command signal indicative of a desired speed of the vehicle;

third means for calculating a first difference between values of the command and speed signals and for producing a first differential signal indicative of the calculated first difference;

fourth means for calculating a second difference between values of the preceding and following speed signals and for producing a second differential signal indicative of an absolute value of the calculated second difference and a sign signal indicative of one of positive and negative signs of the calculated second difference;

fifth means for adjusting the value of the first differential signal in accordance with the absolute value of the second differential signal in relation to the sign of the sign signal and for producing a correction signal indicative of the adjusted value of the first differential signal;

sixth means responsive to the correction signal for producing a control signal in relation to the sign of the sign signal; and

actuator means for actuating said control means in response to the control signal;

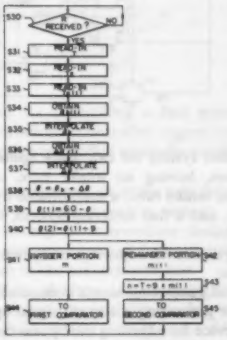
wherein the improvement comprises means for adjusting the absolute value of the second differential signal to a smaller value when the sign of the sign signal changes within a duration defined by the preceding and following speed signals, and wherein said fifth means is arranged to adjust the value of the first differential signal in accordance with the adjusted smaller value of the second differential signal in relation to the sign of the sign signal and to produce a correction signal indicative of the adjusted value of the first differential signal.

4,478,185

AIR-FUEL RATIO AND IGNITION TIMING REGULATION BY DETECTING ENGINE RUNNING CONDITION

Hideki Obayashi, Okazaki; Tokio Kohama, Nishio; Hisasi Kawai, Toyohashi; Toshikazu Ina, Aichi; Daisaku Sawada, and Takashi Shigematsu, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 11, 1983, Ser. No. 483,753
Claims priority, application Japan, Apr. 12, 1982, 57-59758
Int. Cl.³ F02D 5/00; F02B 5/02
U.S. Cl. 123—419 11 Claims



1. A method for regulating an air-fuel ratio and an ignition timing in an internal combustion engine by detecting the engine running conditions, calculating a control output signal based on the detected engine running conditions, and controlling the air-fuel ratio of the engine and the ignition timing of the engine using the calculated output signal, said method comprising the steps of:

carrying out a calculation, using the signals of sensors for detecting engine running conditions, to produce a signal S(12) for controlling the amount of the fuel so as to attain a lean air-fuel ratio which does not cause any combustion variations;

obtaining a read-out basic advance angle value $\theta_b(1)$ on the basis of the detected engine running conditions;

obtaining an interpolated basic advance value $\theta_b(1I)$ on the basis of the obtained read-out basic advance angle value $\theta_b(1)$;

obtaining a read-out advance angle correction value $\Delta\theta(1)$ on the basis of the detected engine running conditions;

obtaining an interpolated advance angle correction value $\Delta\theta$ on the basis of the obtained read-out advance angle correction value $\Delta\theta(1)$;

obtaining an ignition timing value on the basis of the detected engine running conditions and the fuel amount for attaining a lean air-fuel ratio; and

producing an ignition timing signal representing the ignition timing corresponding to the lean air-fuel ratio.

4,478,186

CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH EXTERNALLY SUPPLIED IGNITION

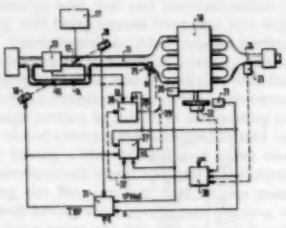
Hartmut Bauer, Gerlingen; Bernhard Bonse, Korntal, and Peter Schmidt, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,489

Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120667

Int. Cl.³ F02D 33/00

U.S. Cl. 123—436 14 Claims



1. In a control system for externally ignited, internal combustion engines, having an intake tube, a throttle valve mounted in the intake tube, a controllable bypass around the throttle valve, and a fuel metering system, the improvement comprising:

an adjusting device for adjusting the opening cross section of the bypass;

control signal generating means connected to the adjusting device for generating a control signal applied to the adjusting device for adjusting the bypass opening; means for generating a load signal dependent on air flow via said throttle valve and applying said signal to said control generating means, and

fuel quantity signal generating means forming part of the fuel metering system connected to receive the control signal from the control signal generating means, said fuel quantity signal generating means producing a fuel metering signal dependent on load and rpm which signal is influenced by said control signal from said control signal generator.

4,478,187

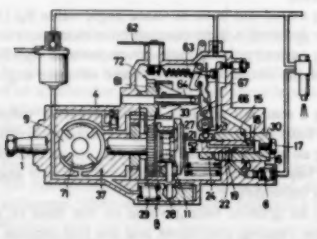
DISTRIBUTION TYPE FUEL INJECTION APPARATUS

Keiichi Yamada, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed May 13, 1982, Ser. No. 377,812

Int. Cl.³ F02M 59/24; F02D 17/00

U.S. Cl. 123—449 9 Claims



1. An internal combustion engine distributive fuel injection apparatus comprising:

a fuel reservoir;

a cylinder defining a fuel pressure chamber, an inlet passage providing communication between said reservoir and said pressure chamber, and a plurality of discharge ports each providing communication between said chamber and a different one of the engine's power cylinders;

a fuel distribution plunger mounted in said cylinder for rotary and reciprocating motion in response to rotation of an engine's drive shaft coupled thereto, said plunger defining suction passages for periodically providing communication between the chamber and said inlet passage and discharge passage means for sequentially registering with said discharge ports to provide communication between said pressure chamber and said discharge ports, said plunger further defining an overflow passage providing communication between said pressure chamber and said reservoir; and

control valve means for automatically closing said overflow passage during certain engine operating conditions, and for selectively opening said overflow passage during other engine operating conditions in synchronism with said registration between said discharge passage means and only predetermined ones of said discharge ports; said control valve means comprising a control sleeve mounted for reciprocating and pivotal movement on said plunger and defining radial passage means for selective registration with said overflow passage, a pivotal coupling for selectively controlling the rotational position of said sleeve relative to said plunger, and an axial coupling for selectively controlling the relative axial positions thereof.

4,478,188

ADJUSTABLE HYDRAULICALLY OPERATED STOP

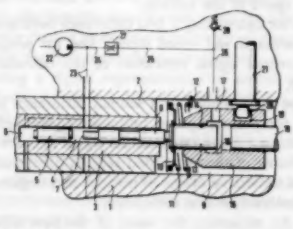
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,373

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111944

Int. Cl.³ F02M 41/00

U.S. Cl. 123—450 12 Claims



1. An adjustable hydraulically operated stop comprising a housing for pulsed loading, in particular for a metering piston of a fuel metering apparatus, said metering apparatus provided with a supply chamber of said piston wherein said hydraulic stop encompasses a stop body which is movably supported in a distributor and arranged to determine the stroke length of the metering piston associated therewith, said stop body also being movably supported with respect to an adjusting member and subjected to a hydraulic fluid in which said hydraulic fluid also surrounds said adjusting member, such that pressure fluctuations acting upon the hydraulic fluid are cancelled out with respect to said adjusting member, whereby the position thereof is unaffected, said adjusting member for said stop body being a sheath provided with a sheath wall and a bore having a chamber-like enlargement, an opening in said sheath wall arranged to discharge into said bore, said sheath further being displaceably guided in an adjusting direction on a rod-like means attached to said housing and engaging said bore, said rod-like means arranged to protrude as far as said chamber-like enlarge-

ment, said sheath further arranged to cooperate with a stop body slidably arranged relative to said sheath whereby said stop body sealingly engages said sheath bore and protrudes into said chamber-like enlargement.

4,478,189

FUEL INJECTION SYSTEM

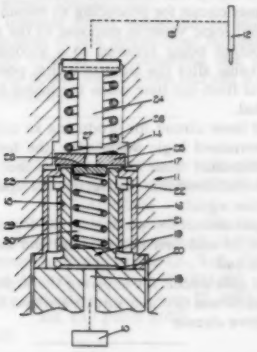
Ivor Fenne, Greenford, England, assignor to Lucas Industries, Birmingham, England

Filed Oct. 26, 1983, Ser. No. 545,672

Claims priority, application United Kingdom, Dec. 8, 1982, 8234946

Int. Cl.³ F02M 39/00, 59/02

U.S. Cl. 123—467 **7 Claims**



1. A fuel injection system for an internal combustion engine of the compression ignition type comprising an injection nozzle having a fuel inlet and a fuel injection pump having a high pressure outlet connected to the fuel inlet of the nozzle by a pipeline, the nozzle incorporating a resiliently loaded fuel pressure actuated valve member which is lifted from a seating to allow fuel flow through an outlet of the nozzle when fuel under pressure is supplied to the nozzle of the pump, valve means disposed in or adjacent the outlet of the pump, said valve means comprising a chamber, a fuel inlet from the pump at one end of the chamber, a first valve member having seat means which in the closed position of the valve member closes said inlet, first resilient means biasing said first valve member to the closed position, a second valve member movable in said chamber, second resilient means biasing said second valve member into contact with a seating which is defined in said chamber downstream of said inlet, passage means controlled by said first valve member and which is opened after a predetermined movement of the first valve member away from said inlet, said passage means when opened allowing fuel flow from said inlet to an outlet from the chamber by way of said second valve member, an opening in said second valve member and a resiliently biased valve element controlling said opening, said opening communicating with an absorbing chamber defined by said first valve member, said valve members being positioned so that during the initial supply of fuel through said inlet the first valve member will engage the second valve member before movement of the valve members is halted by a lift stop and during closure of the valve means the first valve member will continue to move under the action of its resilient loading after the second valve member has contacted the seating, the continued movement of the first valve member causing a reduced fuel pressure in said absorbing chamber, any pressure wave from the nozzle lifting said valve emement and being absorbed in said absorbing chamber.

4,478,190

FUEL INJECTION TIMING CONTROL IN ELECTRONICALLY CONTROLLED ENGINE

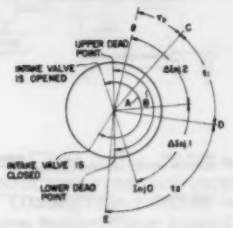
Taiyo Kawai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 26, 1982, Ser. No. 444,366

Claims priority, application Japan, Jul. 14, 1982, 57-121182

Int. Cl.³ F02D 5/00, 5/02; F02B 3/00

U.S. Cl. 123—478 **11 Claims**



1. An apparatus for controlling a fuel injection starting timing for an electronically controlled engine, comprising:

a plurality of vortex controlled air intake combustion chambers;

means for injecting fuel into an intake path from a fuel injector controlled by a basic injection timing;

means for calculating an intermediate timing signal as a function of rotational speed of the engine and fuel injection pulse time in the fuel injector; and

means for combining the intermediate timing signal with said basic injection timing to establish the fuel injection starting timing individually for each of said combustion chambers.

4,478,191

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kenzi Kinoshita; Yukihide Niimi, both of Kariya, and Masahiro Urushidani, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 19, 1983, Ser. No. 459,140

Claims priority, application Japan, Jan. 19, 1982, 57-6236

Int. Cl.³ F02M 51/00

U.S. Cl. 123—489 **4 Claims**

1. An air-fuel ratio control system for an engine, comprising:

an oxygen sensor for detecting an air-fuel ratio of the engine;

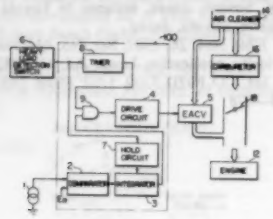
a heavy load detector for detecting a heavy load condition of the engine;

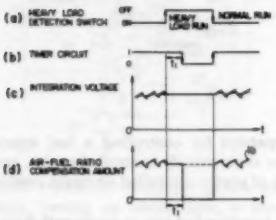
an electric actuator for adjusting the air-fuel ratio; and

an electronic control unit for applying a drive signal to said electric actuator in response to signals from said oxygen sensor and said heavy load detector;

said electronic control unit including means, responsive to the signal of said oxygen sensor, for changing the value of an air-fuel ratio compensation signal, means, responsive to the signal of said heavy load detector, for detecting the lapse of a predetermined time beginning from the time when the heavy load condition is detected, means for holding the value of the air-fuel ratio compensation signal to a first predetermined value preceding the detection of the heavy load condition when the lapse of the predeter-

mined time is not detected, and means for changing the value of the air-fuel ratio compensation signal to a second





predetermined value to enrich the air-fuel ratio when the lapse of the predetermined time is detected.

4,478,192

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

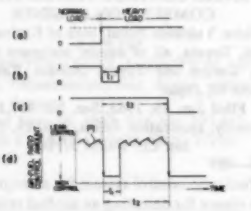
Kenzi Kinoshita; Yukihide Niimi, both of Kariya; Masahiro Urushidani, Toyota, and Hidemi Ohnaka, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 20, 1983, Ser. No. 459,493

Claims priority, application Japan, Jan. 21, 1982, 57-7873

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—489 **4 Claims**



1. An air-fuel ratio control system for an engine, comprising:

an oxygen sensor for detecting an air-fuel ratio of said engine;

heavy load detector means for detecting a heavy load condition of the engine;

an electric actuator for regulating the air-fuel ratio; and

an electronic control unit for applying a drive signal to said electric actuator in response to signals from said oxygen sensor and said heavy load detector means;

said control unit including means, responsive to the signal of said heavy load detector, for detecting the lapse of a first time interval beginning from a time when the heavy load condition is detected and the lapse of a second time interval beginning from the time when the heavy load condition is detected, means for generating the drive signal to enrich the air-fuel ratio regardless of the signal of said oxygen sensor before the lapse of the first time interval, means response to the signal of said oxygen sensor, for generating the drive signal to regulate the air-fuel ratio from the time when the first time interval is lapsed to the time when the second time interval is lapsed, and means for generating the drive signal for enriching the air-fuel ratio regardless of the signal from said oxygen sensor after the lapse of said second time interval.

4. In an air-fuel ratio control system for engines, comprising air-fuel ratio control means, a circuit for driving said air-fuel ratio control means and a control circuit for controlling said drive circuit, said air-fuel ratio control means being subjected to feedback control; the improvement further comprising:

a heavy load detection switch providing a detection signal when a heavy load condition exists,

a first timer circuit for producing an output of a first predetermined logic value in response to the detection signal, said output being restored to a second predetermined logic value after the lapse of a first predetermined time interval from the time when the heavy load condition is detected,

a second timer circuit for producing an output of said first predetermined logic value after the lapse of a second predetermined time interval from the time when the heavy load condition is detected in response to said load detection signal,

a first gate circuit for producing the logic product of the outputs of said first timer circuit and said second timer circuit, and

a second gate circuit for applying the logic product of the outputs of said first gate circuit and said control circuit to said drive circuit.

4,478,193

CONNECTOR DEVICE FOR USE IN AN INTERNAL COMBUSTION ENGINE

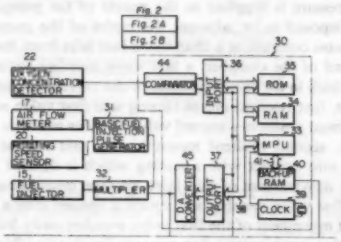
Haruo Watanabe, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

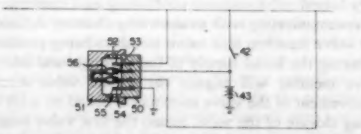
Filed Jan. 25, 1983, Ser. No. 460,989

Claims priority, application Japan, Feb. 18, 1982, 57-23629

Int. Cl.³ F02M *7/16*

U.S. Cl. 123—489 **4 Claims**





1. A connector device for use in an internal combustion engine having a power source, a fuel injector, an oxygen concentration detector detecting the components of exhaust gas, and an electronic control unit calculating a basic fuel injection time period and calculating a correction value of the basic fuel

injection time period on the bases of an output signal of the oxygen concentration detector for producing a control signal indicating an actual fuel injection time period of the fuel injector, said electronic control unit having a nonvolatile memory for storing the mean value of the correction value therein, and an output for outputting voltage corresponding to the correction value, said connector device comprising:

an output terminal connected the output of the electronic control unit and outputting the voltage corresponding to the correction value;

a power input terminal connected to the nonvolatile memory for applying an electric power to the nonvolatile memory;

a power supply terminal connected to the power source;

a connector body firmly supporting said output terminal, said power input terminal and said power supply terminal;

a cap removably fitted onto said connector body and covering said output terminal, said power input terminal, and said power supply terminal; and

a connecting terminal firmly supported by said cap and being connectable to said power input terminal and said power supply terminal for connecting said nonvolatile memory to the power source when said cap is fitted onto said connector body.

4,478,194

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES IMMEDIATELY AFTER CRANKING

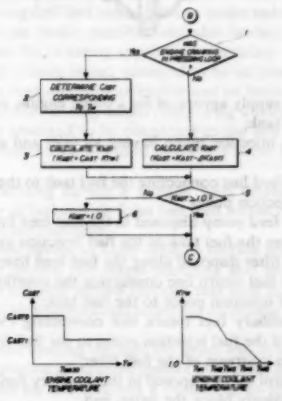
Akihiro Yamato, Shiki; Akihiko Koike, Uraws; Takehiko Hosokawa, and Nobutoshi Maruyama, both of Yokohama, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,898

Claims priority, application Japan, Aug. 25, 1982, 57-147234

Int. Cl.³ F02D 5/02

U.S. Cl. 123—491 **4 Claims**



1. A method of electronically controlling the quantity of fuel being supplied to an internal combustion engine in synchronism with generation of pulses of a predetermined control signal, in response to a fuel increment having a value thereof gradually decreasing after termination of cranking of said engine, the method comprising the steps of: (1) determining whether or not said engine is in a cranking state; (2) setting an initial value of said fuel increment, which corresponds to a product obtained by multiplying the value of a fuel increasing coefficient having a value thereof decreasing as the temperature of said engine increases by the value of a coefficient being a function of the temperature of said engine, immediately upon determination that said engine has left said cranking state; (3) subsequently decreasing said set initial value of said fuel increment upon generation of each pulse of said predetermined control signal until the thus decreased incremental value becomes equal to a value at which no substantial increase takes place in the fuel quantity being supplied to said engine.

4,478,195

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

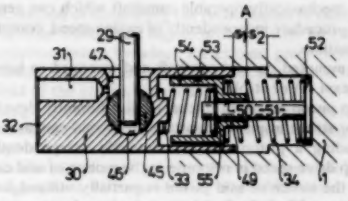
Richard Dorenkamp, Stuttgart; Werner Faupel, Gerlingen; Gerhard Geyer, Munich, and Erich Jäger, Korb, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,803

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121108

Int. Cl.³ F02M 59/20, 59/32

U.S. Cl. 123—502 **2 Claims**



1. A fuel injection pump for internal combustion engines having a cam drive effecting the supply movement of at least one pump piston, said cam drive having a relatively rotatable portion supported in a pump housing for adjustment of injection onset, an adjuster piston cooperating with said cam drive and subjected to the rpm-dependent pressure of a supply pump counter to the force of two restoring springs, characterized in that said springs have different spring constants, that a common spring support plate is disposed between said two restoring springs, one of said last named springs being supported on said adjuster piston and the other of said springs being supported on said housing,

said common spring support plate further includes a radial guide means and that the path of travel of said radial guide means is limited in one direction by a stop means disposed on said guide means,

said adjuster piston executes a predetermined stroke and said spring support plate is displaceable in the same direction by a coupler means engaging said adjuster piston after having executed said predetermined stroke,

said guide means further includes a shaft means which protrudes through a bore in the common spring support plate and is connected with said pump housing,

said shaft is provided with said stop means and one of said springs having a greater initial force than the other being disposed between said spring support plate and said housing, and the other of said springs having a greater stiffness than said one of said springs.

4,478,196

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Karl E. Hafner, and Wolfgang Köhler, both of Cologne, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

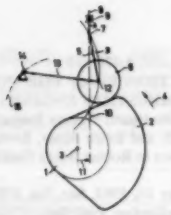
Continuation of Ser. No. 19,432, Mar. 12, 1979, Pat. No. 4,308,839. This application Aug. 11, 1981, Ser. No. 292,031

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810335

The portion of the term of this patent subsequent to Jul. 5, 1999, has been disclaimed.

Int. Cl.³ F02M 59/10

U.S. Cl. 123—504 4 Claims



1. A fuel injection pump for internal combustion engines having a mechanically operable camshaft which can generate injection procedure independently of engine speed, comprising in combination:

a cam mounted on said camshaft and arranged to impart a constant lift or stroke;

a pump piston arranged to carry out differently developed lift or stroke inspite of constant lift or said cam as well as including a piston rod and actuable independently of pump drive speed in response to the motion of said cam so that the stroke of said piston is partially utilized for the delivery of fuel, the fuel delivery volume being controllable by varying the overall effective stroke of said pump piston;

control means for changing velocity of the overall effective piston stroke according to the angular attitude of said cam, said pump piston being movable in a pump cylinder chamber, said pump piston having exterior control edges which cooperate with said pump cylinder chamber for limiting the stroke of said pump piston, and including a housing wherein said control means includes;

a cam follower roller, said roller being movable in response to rotation of said cam and in contact therewith;

means for rotatably mounting said cam follower roller;

power transmission means for transmission of motive power to said pump piston, said power transmission means having a first end operatively connected to said pump piston and a second end adjustably connected to said housing, said power transmission means including at least a cam lever drive unit operatively associated therewith;

a first guide means having parallel sides for guiding said shaft means for said cam follower roller;

a connecting rod having first and second ends, whereby said first end of said connecting rod is secured to said first guide means;

a second swingable guide means for controlling movement of said connecting rod; and

link means secured to the second end of said connecting rod for displacing said other end of said connecting rod in conformity with the number of revolutions of the combustion engine.

4,478,197

FUEL SUPPLY APPARATUS FOR A DIESEL ENGINE

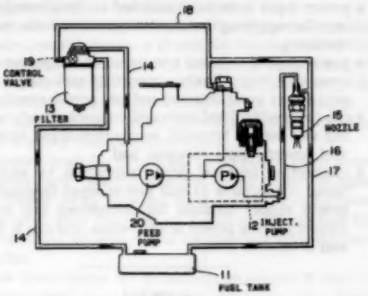
Seishi Yasuhara, Yokosuka, and Katsuto Yamanouchi, Yokohama, both of Japan, assignors to Nissan Motor Company, Japan

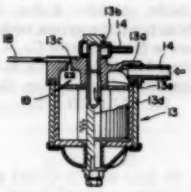
Filed Sep. 29, 1982, Ser. No. 428,228

Claims priority, application Japan, Oct. 12, 1981, 56-160933

Int. Cl.³ F02M 59/00

U.S. Cl. 123—514 7 Claims





1. A fuel supply apparatus for a diesel engine, comprising:

(a) a fuel tank;

(b) a fuel injection pump having an inlet and an overflow outlet;

(c) a fuel feed line connecting the fuel tank to the inlet of the fuel injection pump;

(d) a fuel feed pump disposed in the fuel feed line to supply fuel from the fuel tank to the fuel injection pump;

(e) a fuel filter disposed along the fuel feed line;

(f) a main fuel return line connecting the overflow outlet of the fuel injection pump to the fuel tank;

(g) an auxiliary fuel return line connecting the overflow outlet of the fuel injection pump to the fuel feed line at a position upstream of the fuel filter;

(h) a control valve disposed in the auxiliary fuel return line to selectively block the latter; and

(i) means for driving the control valve in response to the temperature of fuel in the fuel filter so that the control valve will block the auxiliary fuel return line only when the temperature of fuel in the fuel filter is higher than a preset value;

(j) the fuel filter comprising a housing formed with a chamber connected along the fuel feed line and the auxiliary fuel return line, the driving means being disposed in the chamber to respond to the temperature of fuel in the chamber; and

(k) means for diverting the fuel from the auxiliary fuel return line away from the driving means when the control valve opens the auxiliary fuel return line so that the driving means does not respond solely to the temperature of fuel from the auxiliary fuel return line.

4,478,198

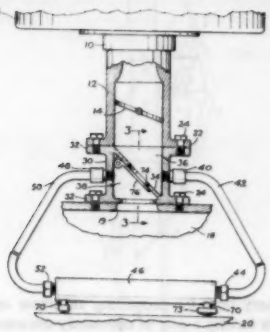
FUEL TREATING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Larry C. Bruhn, P.O. Box 594, Springfield, Oreg. 97477

Continuation-in-part of Ser. No. 373,517, Apr. 30, 1982, abandoned. This application Feb. 14, 1983, Ser. No. 466,050

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—548 2 Claims



1. Fuel treating apparatus for internal combustion engines of the type having fuel feed means with an outlet and arranged to feed fuel to an intake manifold and also having an exhaust manifold, said fuel treating apparatus comprising

(a) air-fuel mixing means arranged to be mounted between the fuel feed means of an engine and an intake manifold,

(b) said air-fuel mixing means comprising a housing having an inlet arranged to be connected to the fuel feed means and an outlet arranged to be connected to the intake manifold,

(c) said housing having a straight path therethrough for passage of fuel and air from fuel feed means of an engine to an intake manifold,

(d) said path having an outer defining surface provided with a spiral groove and ridges confining said groove to develop a swirling motion through said path to subject the fuel and air to centrifugal action for atomizing the fuel and air,

(e) said path opening through the upper end of said housing with a portion of its spiral groove projecting laterally into said path on one side and a portion of its spiral groove providing a recess on the opposite side to efficiently initiate said swirling motion,

(f) the said path being unobstructed in its area between the groove surface,

(g) said path being of a cross sectional area arranged to be less than the cross sectional area of the outlet of fuel feed means to provide increased velocity through said spiral path for increasing the mixing time and turbulence of fuel and air and expansion of the fuel and air mixture,

(h) said outer defining surface of said path, which consists of said spiral groove and confining ridges, including a roughened sand type like finish to increase the agitation and atomization of the fuel mixture,

(i) and an outer casing on said housing providing circulation of a heating medium to offset the refrigeration effect of the expanding mixture.

4,478,199

METHOD OF CONTROLLING EXHAUST-GAS RECIRCULATION IN INTERNAL COMBUSTION ENGINE

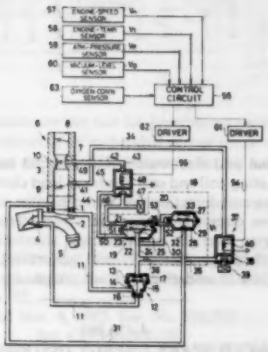
Shin Narasaka, Yono; Kazuo Otsuka, Higashikurume, and Eiji Kishida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,645

Claims priority, application Japan, Mar. 19, 1982, 57-43800

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 6 Claims



1. A method of controlling the recirculation of exhaust gases in an internal combustion engine provided with an exhaust-gas recirculation system by which the exhaust gases emitted from the exhaust manifold are partially recirculated into the intake manifold of the engine, comprising

cutting off the recirculation of exhaust gases to the intake manifold of the engine when the engine is being warmed up,

recirculating exhaust gases to the intake manifold of the engine at a rate variable in a predetermined required exhaust-gas recirculation ratio to the rate at which air is circulated to the intake manifold of the engine after the engine is warmed up, and

recirculating exhaust gases to the intake manifold of the engine with a reduced exhaust-gas recirculation ratio lower than said required exhaust-gas recirculation ratio during a transient period of time intervening the conditions in which the engine is being warmed up and the conditions in which the engine has been warmed up.

4,478,200

ELECTRONIC IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE CAPABLE OF SUPPLYING ELECTRIC POWER TO AUXILIARY UNIT

Akira Nagashima, Kawasaki, and Tadashige Kondo, Tokyo, both of Japan, assignors to Kioritz Corporation, Japan

Filed Dec. 21, 1982, Ser. No. 451,660

Claims priority, application Japan, Dec. 29, 1981, 56-211609

Int. Cl.³ F02P *3/06*

U.S. Cl. 123—605 3 Claims

1. An electronic ignition system of the capacitor discharge type for an internal combustion engine comprising:

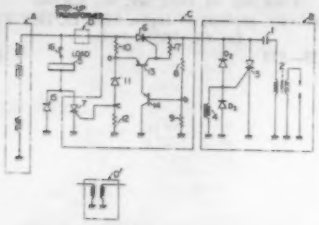
a magneto generator including substantially a single generating coil for generating an alternating electromagnetic force in synchronism with the rotation of said engine;

an electronic ignition circuit including a capacitor connected to said single generating coil and charged by a half-wave of one polarity of said alternating electromagnetic force, and an ignition controlling thyristor in response to an ignition signal generated in an ignition signal generating coil for controlling the discharge of said capac-

itor to flow a discharge current through a primary winding of an ignition coil;

an electrical load circuit adapted to be connected to said generating coil in parallel with said electronic ignition circuit; and

a change over circuit connected between said generating



coil and said electronic ignition circuit and between said generating coil and said electrical load circuit, said change over circuit detecting that said capacitor of said electronic ignition circuit is charged at a predetermined level and changing over the supply of said alternating electromagnetic force generated by said generating coil from said capacitor to said electric load circuit.

4,478,201

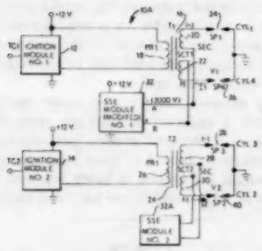
ENHANCED SPARK ENERGY DISTRIBUTORLESS IGNITION SYSTEM (A)

Joseph R. Asik, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 450,932, Dec. 20, 1982,. This application Feb. 23, 1984, Ser. No. 583,063

Int. Cl.³ F02P 3/04

U.S. Cl. 123—620 **2 Claims**



1. A distributorless ignition system with increased spark energy including:

a first ignition coil having a first primary winding and a first secondary winding including a first split secondary center tap;

a second ignition coil having a second primary winding and a second secondary winding including a second split secondary center tap;

a first ignition module coupled to said first primary winding;

a second ignition module coupled to said second primary winding;

a first supplementary spark energy module coupled to said first split secondary tap;

a second supplementary spark energy module coupled to said second split secondary tap;

a first pair of spark plugs coupled to said first secondary winding; and

a second pair of spark plugs coupled to said second secondary winding.

4,478,202

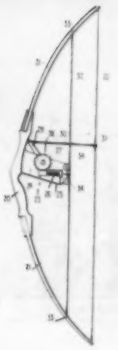
FORCE MULTIPLYING ARCHERY BOW

Jeffrey J. Anderson, P.O. Box 11, Pottersville, N.J. 07979

Filed Jun. 25, 1981, Ser. No. 277,287

Int. Cl.³ F41B 5/00

U.S. Cl. 124—23 R **3 Claims**



1. An archery bow for propelling an arrow comprising a handle section having a pair of oppositely outwardly projecting limbs, each limb having a free end, and a drawstring having two ends adapted for propelling an arrow, which ends are respectively connected to the free ends of said limbs, the combination including:

(a) a means for force multiplication mounted on the bow separate from said drawstring and connected between said resilient limbs for exerting flexing force on said limbs independently of the drawstring in response to drawing movement of the drawstring;

(b) triggering means for releasing said flexing force from said limbs when flexed, whereby the fully reactive force of said flexed limbs is transferred from the force multiplying means directly to the drawstring;

(c) a second string having two ends connected at each end at points of attachment to said limbs, said second string extending between said limbs, said second string having an effective length, each end of said second string respectively being connected to respective ones of said limbs at a location on said respective ones of said limbs between the location of attachment of said force multiplying means to said respective ones of said limbs and respective ones of said points of attachment of respective ones of said two ends of drawstring to said limbs; said means for force multiplication including a lever pivotally mounted to said handle section; said lever having a first moment arm and a second moment arm; said first moment arm being greater in length than said second moment arm; a means for connecting said drawstring to said first moment arm, such that drawing of said drawstring causes movement of said lever; a means for connecting said second moment arm to said second string, such that movement of said second moment arm causes a force to be exerted upon a portion of said second string; said effective string length being the linear distance between the points of attachment of said second string to said limbs; and (d) means for shortening the effective length of said second string between said points of attachment of said second string to said limbs, said means for shortening the effective length being connected to said second moment arm so as to be displaced thereby, said means for shortening being connected to said drawstring such that displacement of said drawstring in a predetermined direction causes displacement of said lever in a predetermined direction causing movement of said second moment arm in turn causing displacement of a predetermined portion of said second string so as to shorten the

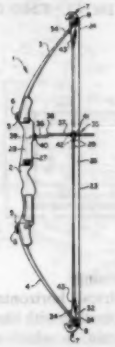
effective length of said second string which thereby creates inward tension of said limbs.

4,478,203

COMPOUND BOW CABLE AND BOWSTRING ATTACHMENT MEANS

Gerald G. Hayes, Gainesville, Fla., assignor to Kidde Recreation Products, Inc., Northbrook, Ill.

Filed Feb. 16, 1983, Ser. No. 467,194
Int. Cl.³ F41B 5/00
U.S. Cl. 124—24 R **14 Claims**



1. In a compound bow having a pair of limbs attached to a handle section, an eccentrically mounted cam attached to each limb and provided with a continuous periphery, a track in said periphery, a bowstring and a pair of tension cables spanning the bow limbs, the improvement comprising: each said cam including main and secondary lobes of dissimilar configuration spaced apart to define an elongated throat therebetween formed by opposed portions of said cam periphery, a bowstring anchor member transversely insertable within said throat, means on the periphery of said throat formed by the opposed portions restraining said inserted anchor member from displacement from said throat radially along a path which lies within the plane of said cam, said tension cables each having a terminal cam segment, said bowstring having opposite end segments, means joining one said tension cable cam segment to one said anchor member, and anchor member means permitting the removable connection of one said bowstring end segment to said anchor member when said anchor member is remote from said cam throat whereby, when said tension cable cam segment and bowstring end segment are respectively joined and connected to said anchor member and said anchor member subsequently transversely inserted into said throat, said bowstring and tension cables are precluded from independent planar displacement relative to said cam.

4,478,204

SYSTEM OF A BOW STABILIZER AND AN EMBEDDED ARROW HEAD REMOVER

Joseph A. Kocsan, 10743 Philadelphia Rd., White Marsh, Md. 21162

Filed Jan. 31, 1983, Ser. No. 462,226
Int. Cl.³ F41B 5/00
U.S. Cl. 124—89 **5 Claims**

1. In a system for stablizing a bow and for withdrawing embedded arrow points of the type having screw threads for attachment to arrow shafts, said system including a rod, a bow stabilization weight on the rod with the rod providing a moment arm for the weight when the weight is mounted to a bow, means for mounting the rod to a bow, and internal screw threads at a first end of the rod for attaching the rod to screw threads of an arrow point; the improvement comprising: said rod having an anvil portion at a second end of the rod, said weight being slidable in position on the rod between the means for mounting and the anvil portion for varying the moment arm of said weight when the rod is mounted on a bow, and said

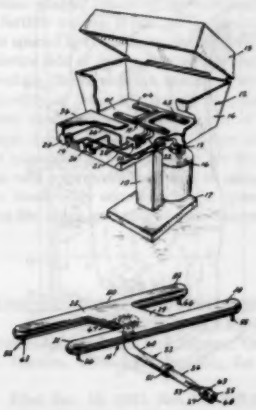
weight being slidable on the rod for hammering on said anvil portion for withdrawing an embedded arrow point when the rod is attached to an embedded arrow point by said screw threads.

4,478,205

DUAL ADJUSTABLE GAS INTAKE ASSEMBLY

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Filed Nov. 4, 1983, Ser. No. 548,723
Int. Cl.³ F24B 3/00
U.S. Cl. 126—25 R **19 Claims**



1. A dual adjustable gas intake tube assembly for a gas burner element comprising:

a first tubular member defining at least one lateral aperture;

an air regulator member slidably received by said tubular member at one end thereof to controllably cover said lateral aperture;

an opening defined by said tubular member at one end for receiving a gas supply means;

a second tubular member in telescoping relationship with said first tubular member at the other end;

a third tubular member in telescoping relationship with said second tubular member at an end opposite said first tubular member;

means operatively associated with said third tubular member at an end opposite said second tubular member for connection with a gas burner element; and

first and second adjustable securing means operatively associated with said first and second tubular members and said

second and third tubular members to adjustably secure said respective tubular members in a fixed position.

19. A dual adjustable gas intake tube assembly for a gas burner element comprising:

a first tubular member defining at least one lateral aperture;

an air regulator member slidably received by said tubular member at one end thereof to controllably cover said lateral aperture;

an opening defined by said tubular member at one end for receiving a gas supply means;

a second tubular member in telescoping relationship with said first tubular member at the other end;

a third tubular member in telescoping relationship with said second tubular member at an end opposite said first tubular member;

means operatively associated with said third tubular member at an end opposite said second tubular member for connection with a gas burner element; and

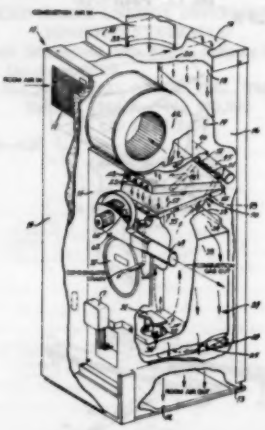
adjustable securing means operatively associated with said second and third tubular members to adjustably secure said respective tubular members in a fixed position.

4,478,206

FURNACE HAVING WATER VAPOR-CONDENSING SECONDARY HEAT EXCHANGER

Hongsik Ahn, Chesterfield, Mo., assignor to Intertherm Inc., St. Louis, Mo.

Filed Jan. 5, 1984, Ser. No. 568,382
Int. Cl.³ F24H 3/00
U.S. Cl. 126—99 A 8 Claims



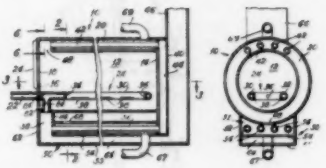
1. For use in a furnace of the type which burns fuel yielding water vapor as a product of combustion, and including a cashing having a substantially vertical path portion for air to which heat is to be exchanged, a water vapor-condensing heat exchanger comprising a hot gas manifold extending substantially horizontally along one side of such vertical path portion, a collector manifold extending substantially parallel thereto along a side of such path portion at a lower elevation, a first set of finned heat exchange tubes having inlet ends connected to and extending perpendicular to and at an upward slope from the hot gas manifold and across such air path portion, a second set of finned heat exchange tubes connected in flow communication with said first set and extending slopingly downward substantially parallel thereto and reversingly across such air path portion to outlet ends at a lower level than said inlet ends of the first set of heat exchanger tubes, downflow means connecting the outlet ends of said second set of tubes to said collector manifold, and means to bent combustion gases from said collector manifold and to permit the drain of condensate therefrom, whereby hot combustion gases passing from said hot gas manifold into said first set of heat exchanger tubes are partly cooled therein without producing substantial condensate and whereby further cooling of such gases on flow through said second set of heat exchanger tubes and thence through said downflow means to the collector manifold produces condensate which drains to and thence out of the collector manifold.

4,478,207

FURNACE

Lewis Walker, 3080 Sixth St. South, and Thomas A. Taylor, 8794 W. KL Ave., both of Kalamazoo, Mich. 49009

Filed Jun. 14, 1982, Ser. No. 388,250
Int. Cl.³ F24D 9/00
U.S. Cl. 126—101 4 Claims



1. A furnace comprising:

an elongate, cylindrical, horizontally-disposed combustion chamber in combination with blower means for creating a forced draft therein, in which said furnace is provided with a water jacket surrounding and in heat exchange with said combustion chamber and has heat transfer means comprising a plurality of sets of axially-disposed fire-tubes in heat exchange relation with water, and in which said furnace is further provided with gas directing means for directing a flow of combustion gases from said combustion chamber through said sets of fire-tubes in succession, and with water directing means whereby cold water is introduced and relatively hot water is withdrawn after passing in heat exchange with said sets of fire-tubes, at least one set of said fire-tubes being within the confines of said water jacket.

4,478,208

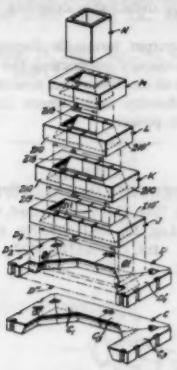
FIREPLACE CONSTRUCTION

Jay R. Pitha, R.D. #3, Box 211, Washington, N.J. 07882

Continuation-in-part of Ser. No. 359,058, Mar. 17, 1982,. This application Jan. 23, 1984, Ser. No. 572,841
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 12 Claims

1. A fireplace construction, comprising a first stacked plurality of courses of modular prismatic blocks laid upon a base to define an open-fronted firebox region of opposed sidewalls and a rear wall contiguous thereto, lintel means spanning the open front at an upper course of said blocks and constituting with the blocks of said upper course the peripheral enclosure of a generally rectangular opening for upward conduct of firebox-exhaust products of combustion, said opening having an elongate dimension in the span direction of the lintel and a lesser dimension transverse to the elongate dimension; and a second stacked plurality of courses of modular blocks laid upon the lintel and upon upper-course blocks of said peripheral enclosure, the blocks of said second plurality comprising (1) U-shaped end blocks wherein an upstanding central body connects upstanding arms which are spaced to span substantially the transverse dimension of the opening, and (2) flat upstanding spacer blocks of thickness substantially matching the thickness of said arms, the inner-wall surface of the central body sloping from a relatively narrow lower surface of the body to a relatively wide upper surface of the body, and the width difference between said upper and lower surfaces of the body

being substantially one half of the longitudinal extent of said spacer blocks; whereby the first course of the second stacked plurality may comprise one of said end blocks at each of the respective ends of the rectangular opening, with the arms of said end blocks extending toward each other in partial longitudinal register with longitudinal margins of the rectangular opening, and first like pluralities of spacer blocks in longitudinal end-to-end abutment with each other and with the respec-



tive arms of the two end blocks; and further whereby the second course of the second stacked plurality may be similarly constituted of opposed end blocks having their respective arms connected by end-to-end arrays of second like pluralities of spacer blocks, each second plurality comprising one less spacer block than each first plurality, so that the sloping inner-wall surfaces of the end blocks of the respective courses may conjointly define a single inwardly convergent surface.

4,478,209

RADIANT ENERGY COLLECTOR HAVING PLASMA-TEXTURED POLYIMIDE EXPOSED SURFACE

C. Richard Guarnieri, Annarock Dr., Somers, N.Y. 10589

Filed Jun. 30, 1982, Ser. No. 393,952

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—417 **32 Claims**

1. A radiant energy collector fabricated from a substrate coated on at least a portion of the surface thereof exposed to radiant energy with polyimide which has been surface-texturized to impart to said coated substrate high absorption and low emissivity for radiant energy, the surface of the substrate opposite that exposed to the radiant energy being in contact with a working fluid.

4,478,210

SOLAR HEATING SYSTEM

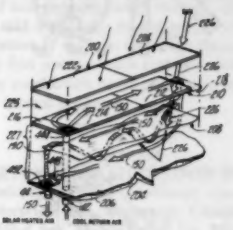
Leonard M. Sieradzki, 2698 Country Club Dr., Petoskey, Mich. 49770

Filed Apr. 16, 1979, Ser. No. 30,351

Int. Cl.³ F24D *3/02*

U.S. Cl. 126—418 **51 Claims**

1. A solar collector construction adapted to be mounted to a supporting surface inclined at any angle from vertical to horizontal comprising a sill beam adapted to extend horizontally along the supporting surface and at least a head beam adapted to extend parallel to said sill beam and adapted for mounting to said supporting surface so as to form an opposite side wall of said solar collector, an end jamb extending perpendicularly to said head and sill beams to define one end wall of said solar collector, a manifold turnaround jamb extending perpendicularly between said sill and head beams and spaced longitudinally of the collector from said end jamb to define an opposite end wall of said collector, said beams and jambs each comprising an aluminum extrusion having a generally I-shaped cross-sectional configuration defined by a bottom flange adapted for mounting against said supporting surface by fasteners, a top flange protruding laterally from the opposite sides of a center web of the cross section, the portion of the top flange protruding internally within the collector towards one another providing a shelf for mounting of an outer glazing light array on said collector, the portion of said top flange protruding laterally outwardly externally of said collector providing a mounting surface for surrounding weather-proof flashing, a plurality of cap strips secured to the upper edges of said beams and jambs in superimposed relation to said outer glazing and surrounding flashing to clamp the same against the top flanges of said beams and jambs, said beams and said end jamb each having an intermediate flange protruding laterally from the center web



thereof interiorly of said collector to form a shelf intermediate said top and bottom flanges of said beams and jamb for supporting an inner glazing lite array thereon, said beams and end jamb each further having a pair of longitudinally extending hook flanges spaced laterally from one another and protruding from the interior side of said center web in the space between said intermediate flange and the interior portion of said top flange, a plurality of retainer channels of generally C-shaped cross-sectional configuration having a pair of free end edges engaged respectively with said hook flanges and surmounting the adjacent edges of said inner glazing lite array to clamp the same against said intermediate flanges of said beams and end jamb, and a black body mounted in the space between said inner glazing lite array and said bottom flanges of said beams and jambs.

4,478,211

SELF-PUMPING SOLAR HEATING SYSTEM WITH GEYSER PUMPING ACTION

Eldon L. Haines, 106 Alberta La., Eugene, Oreg. 97404, and Ralph E. Bartera, 4840 Hampton Rd., La Canada, Calif. 91011

Filed Jun. 18, 1982, Ser. No. 389,630

Int. Cl.³ F24J *3/02*; F28D *13/00*

U.S. Cl. 126—433 **2 Claims**

1. A self pumping heating system for exposure to a heat source, said system comprising,

a collector including an inlet manifold and a header, a multitude of inclined riser tubes for exposure to the heat source and in communication with said inlet manifold and said header, said header receiving liquid and vapor discharged from said riser tubes and separating same by gravity,

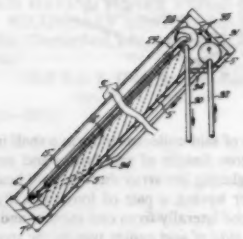
a vapor condenser vessel disposed adjacent said header, vapor passageways communicating said header with said vapor condenser,

a discharge conduit passing downwardly from said header, said discharge conduit in upstream communication with the lowermost portion of said header to receive a gravitating liquid flow therefrom,

heat exchanger means located below said collector and receiving heated liquid from said discharge conduit,

a return conduit carrying liquid cooled in the heat exchanger means in upstream communication with said heat ex-

changer means and in downstream communication with the inlet manifold of the collector, a segment of said return conduit being said vapor condenser vessel wherein the cooled liquid normally being of a temperature lower than the riser tube discharged vapor serves to condense the vapor into condensate to provide a header vapor pressure conducive to a geyser pumping action in said riser tubes, said return conduit carrying a merged flow of said condensate and the heat exchanger cooled liquid to said inlet



manifold, said pumping action lifting liquid from the riser tubes and hence causing a difference in liquid levels between the liquid level in the riser tubes and the higher liquid level in the discharge conduit whereby liquid will circulate through the system because of a gravity imbalance, and

a liquid medium of a volume to substantially occupy the system components at operating temperatures with the exception of said header with fluid vapor occupying the remainder of the system.

4,478,212

ADAPTER FOR COUPLING A CAMERA WITH AN ENDOSCOPE

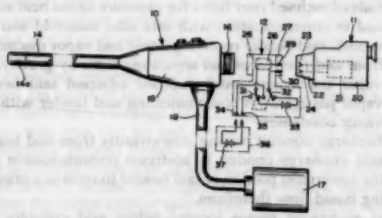
Shelji Asano, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Oct. 22, 1982, Ser. No. 436,061

Claims priority, application Japan, Oct. 22, 1981, 56-157482[U]

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **5 Claims**



1. An adapter for coupling a camera having electrical control circuits with an endoscope having an ocular section, said camera being of the type having camera control circuits adapted to receive electric power through an endoscope to which the camera is coupled, and said endoscope having no function of electric power-transmission to a camera which is coupled thereto, said adapter comprising:

first means for detachably coupling the adapter to the endoscope at the ocular section of the endoscope;

second means for detachably coupling the adapter to the camera; and

electric power output terminals disposed in said second means for electrically connecting the control circuits of said comara to an electric power source separate from said endoscope, whereby said camera control circuits can receive electric power.

4,478,213

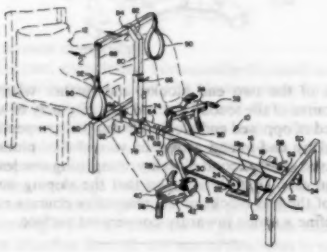
THERAPEUTIC LIMB MANIPULATOR

Donald E. Redding, Box 831, Port Orford, Oreg. 97465

Filed Aug. 20, 1982, Ser. No. 410,025

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—25 R **1 Claim**



1. A therapeutic limb manipulating apparatus for exercising either the legs or arms of a patient, comprising

(a) a longitudinal body member having front and rear portions longitudinally adjustable with each other for varying the length of said body member,

(b) front support means on said body member,

(c) attaching means on the rear portion of said body member arranged to be associated with rear support means capable of positioning said body member in selected positions depending on its use as a leg manipulator or arm manipulator,

(d) crank means on said rear portion of the body member having opposite pedals spaced 180 degrees apart,

(e) motor means on said body member operatively connected to said crank means for rotating the latter,

(f) each of said pedals having pivot connection to said crank means and also having opposite surfaces,

(g) strap means for attaching the feet and hands to said surfaces,

(h) one of said surfaces having a heel rest for supporting the feet for use of the apparatus as a leg manipulator and the other surface comprising a hand engaging surface for supporting the hands for use of the apparatus as an arm manipulator whereby upon adjusting the body member and length for securing the hands or feet on said pedals and upon selective association with a rear support means, the feet or arms of a patient who is positioned adjacent the apparatus are exercised by operation of said motor means,

(i) a standard mounted on the rear portion of said body member for adjustment longitudinally along the latter,

(j) and strap means on said standard having opposite ends terminating in loops arranged to loop around the knee portions of a patient's legs and provide support for the legs as the legs are being manipulated by said crank member,

(k) said strap means being supported on said standard for lateral reciprocal movement as said limbs are manipulated in alternating relation,

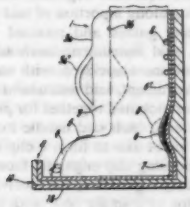
(l) said standard being adjustable in height for adjustment to a patient.

4,478,214

MEDICAL BOOT APPARATUS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

William D. Lamont, 24609 Spring La., Mt. Clemens, Mich. 48043

Filed Mar. 21, 1983, Ser. No. 477,498
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—149 **15 Claims**



1. A medical boot apparatus, comprising:

a substantially boot-shaped main body portion fabricated of a substantially flexible shape-retentive material;

said main body portion having an upper front opening extending downwardly to a substantially open toe portion;

the sole portion of said main body portion including a forwardmost portion extending beyond said open toe portion;

means for selectively fastening said upper front opening in a closed position;

a raised heel cord portion formed along an inner rear surface of said main body portion so as to support the back of a bedridden patient's leg when it is positioned in said main body portion such that the patient's heel is elevated with no pressure exerted thereagainst; and

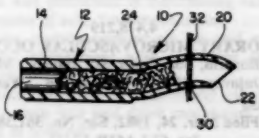
first fluid cushioning means provided on said raised heel cord portion for cushioning the back leg portion of said patient supported by said raised heel cord portion.

4,478,215

BREATHING DEVICE

Raymond J. Hanlon, 4 Wildflower Rd., Barrington, R.I. 02806

Filed Jul. 26, 1982, Ser. No. 401,497
Int. Cl.³ A61M *15/00*
U.S. Cl. 128—201.13 **8 Claims**



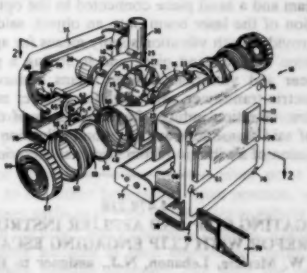
1. A breathing device for use by runners, joggers, and the like for preheating and/or controlling the volume of air entering the user's oral cavity through the breathing process, said device comprising an elongated hollow generally tubular body defining a flowpath therethrough having opposite inner and outer end portions terminating in open inner and outer ends, said inner end portion having a relatively thick wall construction with respect to said outer end portion and an oblong cross-section so as to facilitate gripping said inner end portion in the user's mouth by his or her teeth, said outer end portion adapted to extend between and beyond the user's lips so as to project at least partially out of said oral cavity, an open mesh relatively densely packed heat exchange element disposed in the flowpath of said body and acting as a moisture trap for exhaled air leaving said device and such that air entering said device is preheated and/or controlled in volume thereby, said inner end portion being straight and comprising substantially half of said tubular body, said outer end portion being curved and comprising substantially the other half of said tubular body whereby said tubular body can be easily maintained between a first position of at least partially to a second position of almost completely in the user's mouth and utilized as the only means by which air enters and exits the user's oral cavity 1 said heat exchange element disposed in said body such that it overlaps substantial portions of said inner and outer end portions wherein all of said heat exchange element within said body is positioned in said oral cavity in said second use position and a substantial portion of the heat exchange element is in said oral cavity in said first position such that said element is additionally heated by conduction by its position in said oral cavity in said first and second positions.

4,478,216

PORTABLE AIR FILTRATION DEVICE

Hubert G. Dukowski, North Vancouver, Canada, assignor to H.G.D. Enterprises Ltd., Vancouver, Canada

Filed Apr. 13, 1982, Ser. No. 368,024
Claims priority, application Canada, Apr. 6, 1982, 400573
Int. Cl.³ A62B *7/10*
U.S. Cl. 128—204.21 **3 Claims**



1. A portable breathing assist comprising:

an external housing,

an internal scroll housing within the external housing, the scroll housing comprising a central plate mounted in said external housing and having a central inlet for air and a cup-like member having a tangential outlet for air mounted to said central plate concentrically with said central inlet, said tangential outlet extending through said external housing as well, breathing tube means connected to said outlet;

a radial impeller rotatably mounted within the scroll housing for moving air from said inlet to said outlet,

an electrical motor within said external housing but outside said scroll housing and having means connected to said impeller for rotating the same,

the external housing defining at least one opening,

filter means mounted over said at least one opening for filtering all air passing therethrough;

air manifold means within said external housing, the air manifold defining a passageway for air from said at least one opening to said central inlet, along which air can travel without encountering said electrical motor, said air manifold means having a first portion of rectangular cross-section comprised of said inner plate having said central inlet therethrough, two substantially parallel side plates

connected perpendicularly to said inner plate and an outer plate substantially parallel with said inner plate and connected to said side plates, said air manifold means having a second portion comprised of conduit means fluidically connecting said at least one opening to said first portion, the said motor being located on the other side of the cup-like member from the inner plate.

4,478,217

LASER SURGICAL APPARATUS

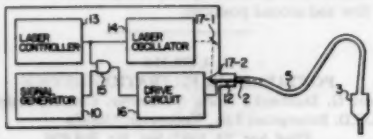
Tamotsu Shimada, Akishima; Akio Kumada, Kokubunji; Daizo Tokinaga, Hachioji; Chiaki Shinbo, Mitaka; Hideyuki Horiuchi, Kokubunji, and Masamoto Takatsuji, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,213

Claims priority, application Japan, Mar. 16, 1981, 56-36623; Oct. 21, 1981, 56-155478

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **16 Claims**



1. A laser surgical apparatus comprising a laser oscillator operable to oscillate for producing a laser beam, an optical path connected to the laser oscillator for transmission of the laser beam and a hand piece connected to the optical path for irradiation of the laser beam onto an object, said hand piece being provided with vibration supply means for application of a vibration to said hand piece and including a piezoelectric transducer and vibration inducer means connected to said piezoelectric transducer, said vibration inducer means including a first vibration inducer for conversion of the vibration mode of said transducer and a second vibration inducer for transmission of a vibration from said first vibration inducer.

4,478,218

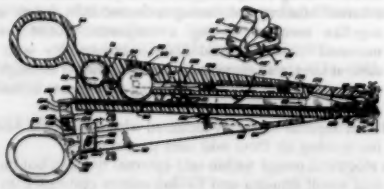
LIGATING CLIP AND APPLIER INSTRUMENT THEREFOR WITH CLIP ENGAGING ESCAPEMENT

Robert W. Mericle, Lebanon, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Feb. 26, 1982, Ser. No. 352,835

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **20 Claims**



11. In a ligating clip comprising first and second legs joined at their proximal ends by a resilient hinge and terminating at their distal ends in latch means for holding the clip latch closed when the clip legs are squeezed together, each leg having a vessel clamping inner face in opposition to a vessel clamping inner face of the other leg, the improvement characterized in that:

said clip includes a base extending along the length of said first leg from the distal end of said first leg for only a portion of the length of the clip, said base terminating short of the resilient hinge whereby said resilient hinge extends rearwardly beyond said base to define an open recess adjacent the rearward end of said base below said hinge, said base further including (1) a front engaging face and (2) guide means for each being engaged by portions of an instrument that may be used to apply said clip, said guide means including a channel on each side of said clip that is defined along the length of the base.

14. A scissors-type medical instrument for repeatedly applying a plurality of ligating clips seriatim about tissue wherein each said clip is initially provided in an open state and wherein each said clip comprises first and second legs joined at their proximal ends by a resilient hinge and spaced apart at their distal ends with said legs having latch means at said distal ends for holding said clip closed in clamping engagement about said tissue when said legs are squeezed together; each said clip including a base extending along a portion of said first leg and including means for being guided and retained by, and for supporting said clip in, said instrument; each said clip also including engagement means associated with said base for being engaged by said instrument, said instrument comprising:

first and second handles mounted together for pivotal movement about a pivot axis, each said handle extending forwardly beyond the pivot axis to form a clip closing jaw, said jaws having opposing clip engaging faces;

said first handle including a guideway for receiving a plurality of said open clips in a single row with the clips arranged in end-to-end relationship with the distal end of said first leg of one clip abutting the hinge of the next forwardly adjacent clip, said first handle including clip retaining means along said guideway for engaging said clip base to retain said clip in sliding engagement within said first handle in said guideway;

means for moving said row of clips forwardly along said guideway to said jaws;

an escapement means at said first handle jaw for engaging said clip engagement means to prevent the passage of the front clip therepast until the jaws have latched the front clip closed and for accommodating movement of the front clip therepast after the jaws have latched the front clip closed;

rod means extending rearwardly from said escapement means along said first handle for being operated to move said escapement; and

operating means carried by said second handle for operating said rod means whereby, (1) when said first and second handles are moved apart a sufficient amount, said escapement positions said front clip in the region of said jaws and prevents discharge of the front clip from the jaws and, (2) after said first and second handles are moved toward one another to latch the front clip closed and before said handles are again moved apart said sufficient amount, said escapement means permits discharge of said closed front clip from said jaws while preventing positioning in said jaws of the next rearwardly adjacent clip.

4,478,219

TEMPORARY MICROVASCULAR OCCLUDER

Rodney A. Rozario, 863 Essex St., Bangor, Me. 04401, and Manuel Dujovny, 2573 Wickfield Rd., West Bloomfield, Mich. 48033

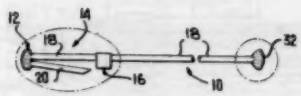
Filed Mar. 24, 1982, Ser. No. 361,386

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **4 Claims**

1. A microvascular occluder comprising a base integral with a stem, said stem comprising a pair of compressible, non-inflatable, tubular arms projecting in proximate, normally-divergent relationship from said base for capturing a blood vessel immediately at said base and extending transversely between said arms, each of said arms comprising a normally-soft, tubular element, one of said arms being shorter than the other and having a free end; said arms having a rounded contour-flexibility and pliability for providing gentle contact with a blood

vessel being compressed and causing minimal endothelia damage to said blood vessel when it is being compressed; and cuff means comprising a sleeve on said other arm and normally captured thereon and slidable over said free end of said one arm and over both said arms in unison for gradually and progressively compressing said arms onto the captured transverse blood vessel between said cuff means and said base for gradually and softly applying pressure to said transverse blood vessel with minimal degree of endothelial damage and occluding the



passage of blood therethrough, said other arm having stop means thereon for capturing the cuff means thereon, said base comprising a flat element integral with adjacent ends of said arms and sealing them off thereat, said base extending laterally of said adjacent ends of said arms and maintaining said arms in the normal divergent relationship when said occluder is being applied on a said blood vessel and providing means for handling said occluder and providing means for supporting said occluder in an operative position.

4,478,220

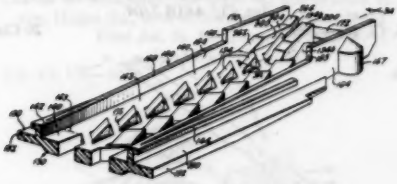
LIGATING CLIP CARTRIDGE

John Di Giovanni, Irvington; Steven Failla, Chester; Laszlo Huebscher, New Brunswick; John S. Pedlick, Butler; John R. Menges, Woodbridge, and Lech Proszynski, Spotswood, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 5, 1982, Ser. No. 345,976

Int. Cl.³ A61B *17/12*; B25C *5/02, 5/06*

U.S. Cl. 128—326 **9 Claims**



1. A cartridge for housing a plurality of ligating clips and adapted for removable engagement with a drive mechanism, said cartridge including:

a fixed rack adapted for removable engagement with said drive mechanism, and a moving rack adapted for short stroke reciprocating motion longitudinally along said fixed rack and positioned in confronting relationship to feeding means of said drive mechanism;

a short stroke motion capture pin on said moving rack adapted for engagement with a portion of said drive mechanism;

said fixed rack including a transversely extending flange adapted to snap into said drive mechanism to hold said fixed rack in position;

said fixed rack including first and second side walls and a base arranged to define a generally U-shaped space therebetween;

each of said first and second side walls of said fixed rack having a free edge facing said moving rack;

said fixed rack base including a plurality of pairs of ratchet fingers projecting into said U-shaped space and extending longitudinally along said fixed rack base;

the upper periphery of said fixed rack side walls each including a rail along which said moving rack may reciprocate;

said moving rack including a base extending generally longitudinally of said fixed rack and two side walls extending from said moving rack base to define the general U-shaped space, a plurality of pairs of ratchet fingers projecting into said U-shaped space and extending longitudinally along said moving rack;

said moving rack side walls including inwardly projecting portions engaging said fixed rack side wall rails.

4,478,221

INSTRUMENT FOR USE IN SURGERY

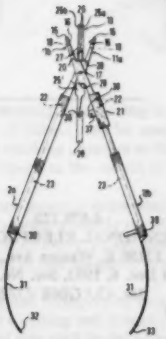
Volker Heiss, Tuttlingen, Fed. Rep. of Germany, assignor to Josef Heiss Medizintechnik GmbH, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,933

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126578

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R **19 Claims**



1. An instrument for use in surgery, and in particualr microsurgery, for performing suturing, comprising:

a pair of elongate clamping members secured one to the other for pivotal movement abut a pivot point one in relation to the other between an open position, wherein facing inner surfaces of each member are angularly spaced one from the other, and a clamping position, wherein said facing inner surfaces of each member are brought into substantially parallel abutment one with the other to clampingly hold an article therebetween, at least one of said members including an elongate recess formed along an inner surface axis, said inner surfaces extending along said members on a first side of said pivoed on at least one of said clamping limbs, said cutting means being relatively movable between a retracted position within said elongate recess and an extended position projecting beyond a clamp member tip portion.

4,478,222

ELECTROCHEMICAL SENSING APPARATUS WITH IN SITU CALIBRATION

Gerrit Koning, Vries, and Piet Bergveld, Enschede, both of Netherlands, assignors to Cordis Europa N.V., Roden, Netherlands

Filed Mar. 10, 1981, Ser. No. 242,351

Claims priority, application Netherlands, Mar. 10, 1980, 8001420

Int. Cl.³ A61B *5/00*

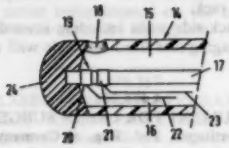
U.S. Cl. 128—632 **14 Claims**

1. A chemically sensitive probe for taking measurement of the chemical properties of biological fluids in vivo with in vivo recalibration, comprising

a closed tube having a wall with a fixed opening to admit fluid to be tested,

an electrochemical sensor assembly affixed to the inside wall

of said tube covering said opening to define therewith a sensing chamber, and



means defining an infusion channel in said tube for flooding said sensor assembly with a known fluid for calibration during which the fluid to be tested is temporarily expelled through said opening.

4,478,223

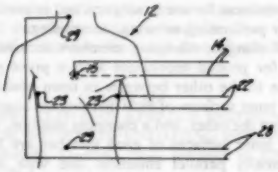
THREE DIMENSIONAL ELECTROCARDIOGRAPH

Douglas R. Allor, 17190 E. Warren Ave., Detroit, Mich. 48224

Filed Dec. 6, 1982, Ser. No. 447,155

Int. Cl.³ G06K *15/20*

U.S. Cl. 128—699 **5 Claims**



1. Means for the non-invasive real time three-dimensional analysis of the electrical activity of a patient's organ comprising:

a first set of paired electrodes, a first preamplification means for developing a first modulated electrical signal characteristic of the plane through the organ represented by said first electrodes based on the electrical signals received from said first electrodes;

a second set of paired electrodes, a second preamplification means for developing a second modulated electrical signal characteristic of the plane through the organ represented by said second electrodes based on the electrical signals received from said second electrodes;

a third set of paired electrodes, a third preamplification means for developing a third modulated electrical signal characteristic of the plane through the organ represented by said third electrodes based on the electrical signals received from said third electrodes;

signal means for modifying and amplifying said first, second, and third modulated electrical signals; and

means for receiving said first, second, and third amplified modulated signals and analyzing said signals in a three-dimensional coordinate system based on the phase differences between said signals.

4,478,224

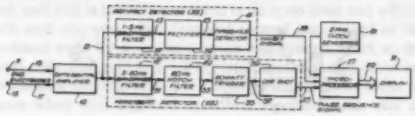
ARTIFACT DETECTOR FOR HEARTBEAT RATE MEASURING SYSTEM

Wilber H. Bailey, Leucadia, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.

Filed Nov. 26, 1982, Ser. No. 444,782

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—706 **11 Claims**



1. Apparatus for monitoring an EKG signal and estimating heartbeat rate, comprising:

first and second electrodes adapted to contact a patient and transmit an EKG signal indicative of heartbeat activity;

heart rate means, connected to the first and second electrodes, for monitoring the EKG signal and estimating heartbeat rate;

artifact detection means for monitoring the EKG signal to detect the occurrence of heartbeat artifacts therein and for producing a corresponding inhibit signal; and

means for inhibiting the heart rate means in response to the inhibit signal, whereby the estimate of heartbeat rate is substantially unaffected by the occurrence of heartbeat artifacts.

4,478,225

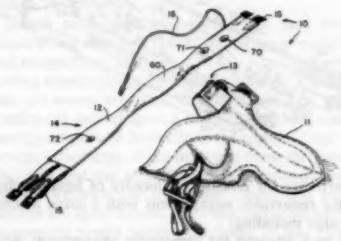
HEART MONITOR FOR HORSES

John G. Ewing, 1515 Glenmere Rd., Greeley, Colo. 80631

Filed Dec. 2, 1982, Ser. No. 446,321

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—706 **20 Claims**



1. A heart monitor for measuring the heart rate of a horse during training and other active periods comprising:

(a) saddle means mountable on a horse for supporting a rider;

(b) girth means operably attachable to said saddle means for securing said saddle means to a horse;

(c) electrode means operably mounted on said girth means for providing touching electrical contact with the body of a horse mounted with said saddle means for detecting voltage changes on the skin surface of the horse and providing an electrical signal in response thereto;

(d) signal processing circuitry means for processing said electrical signal from said electrode means;

(e) display means for receiving said processed signal and generating a human readable display indicating the heart rate of a horse mounted with said saddle means; and

(f) power supply means for providing electrical energy to operate said signal processing circuitry means and said display means.

4,478,226

SELF-PROPELLED HARVESTER THRESHER WITH AXIAL PRODUCT FLOW

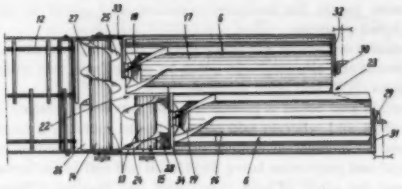
Franz Tophinke, Harsewinkel, Fed. Rep. of Germany, assignor to CLAAS OHG, Harsewinkel, Fed. Rep. of Germany

Filed Oct. 8, 1982, Ser. No. 433,806

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3139933

Int. Cl.[3] A01F *7/06, 12/00*

U.S. Cl. 130—27 T 8 Claims



1. A self-propelled harvester thresher with an axial product flow, comprising a housing having an axis, a product inlet opening and a product outlet opening; an inclined conveyor transporting the product to said product inlet opening; and two axially extending rotors which form together with said housing an annular chamber extending between said product inlet opening and said product outlet opening and having a separating zone, said rotors extending parallel to one another and being offset relative to one another in an axial direction so as to form by said offset a product receiving stage and a product discharging stage.

4,478,227

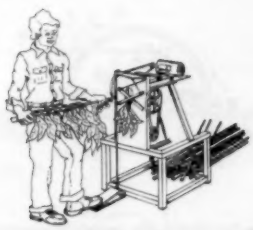
LEAF STRIPPING MECHANISM

Charles W. McKinney, 363 Main St., and Brittain H. McKinney, Hogan Rd., both of Gordonsville, Tenn. 38563

Filed Jul. 16, 1982, Ser. No. 398,920

Int. Cl.[3] A01D *45/16*

U.S. Cl. 130—30 R 4 Claims



1. A tobacco stripper for removing leaves from a tobacco stalk comprising:

a base;

a plate having an elliptical opening attached to said base;

crop pulling means rearward of said plate for pulling the tobacco stalks through said opening;

means for varying the size of said opening, said size varying means comprising first and second scrapper bars pivotally attached at one of their ends to said plate on opposite sides of the opening, the bars intersecting at a point substantially along the vertical centerline of said opening;

means for urging the ends opposite said attached ends of said scrapper bars relative to one another so as to move the point of intersection substantially along said centerline, thus varying the size of the opening so as to accommodate different size tobacco crops; the tobacco leavings being stripped by the intersecting bars along the region of the point of intersection and an edge of the elliptical opening.

4,478,228

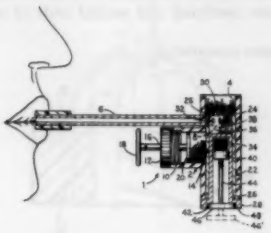
TOBACCO SMOKING PIPE

René A. Chister, 20702-177 El Toro Rd., El Toro, Calif. 92630

Filed Sep. 30, 1982, Ser. No. 431,470

Int. Cl.[3] A24F *1/26, 3/02*

U.S. Cl. 131—180 6 Claims



1. A tobacco smoking pipe having a smoking chamber for receiving a plug of tobacco to be smoked and a pipe stem connected to said smoking chamber so that tobacco smoke can be drawn therethrough to the mouth of the smoker, said pipe comprising:

tobacco magazine means communicating with said smoking chamber for storing a supply of tobacco to be smoked,

means by which to move an amount of tobacco from the supply thereof in said magazine into said smoking chamber,

tobacco cutting and transporting means having at least one side wall and a cutting and transporting surface formed at an end of said side wall to define an interior, said cutting and transporting means being dimensioned to travel through said smoking chamber in orer to cause said cutting and transporting end surface to both cut off a plug of the tobacco that has been moved from said magazine into said cutting chamber and transport said tobacco plug to a location in said smoking chamber that is separated from the location of the connection of said pipe stem to said smoking chamber, said cutting and transporting end surface having at least one smoke intake port extending therethrough through which tobacco smoke can be drawn, and

a plug member removably positioned at the interior of said cutting and transporting means and associated therewith to establish a space at the interior of said cutting and transporting means, said space extending at least between the smoke intake port of said cutting and transporting end surface and the connection of said pipe stem to said smoking chamber, so that burning tobacco ash that is drawn through said intake port from the tobacco plug can be retained in said space until said plug member is removed from the interior of said cutting and transporting means in order to permit the removal of the burnt tobacco ash and the cleaning of said cutting and transporting means interior.

4,478,229

SMOKE FILTERS

John A. Luke, Hampshire, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 7, 1983, Ser. No. 464,309

Int. Cl.[3] A24F *3/04*

U.S. Cl. 131—336 18 Claims

17. In a smoke filter comprising:

(a) rod-like filter plug means of filtration material having a mouth end and a distal end;

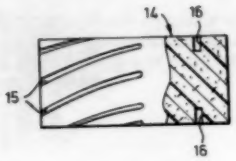
(b) a plurality of airflow ducts equiangularly spaced around

said filter plug means and each extending along said filter plug means from a first end open at said mouth end of said filter plug means to a second end open at the periphery of said filter plug means, said second end of each airflow duct being spaced from said mouth end of the filter plug means;

(c) air impervious wrapping means enwrapping said filter plug means and having a radially inwardly facing surface contiguous therewith; and

(d) means defining first ventilation perforations of said wrapping means overlying said second ends of said airflow ducts;

the improvement comprising:



(e) means defining second ventilation perforations overlying said filter plug means and remote from said airflow ducts thereof, said second ventilation perforations being effective to permit the ingress of a second stream of ambient air directly into the interior of said filter plug means independently of said ingress of the first stream of ambient air into said airflow ducts; and

(f) means defining a plurality of longitudinally extending surface grooves to said filter plug means; whereby said wrapping means radially inwardly facing surface contiguous to said filter plug partly defines said airflow ducts and said surface grooves of the filter plug means also partly define said airflow ducts.

4,478,230

LIGHTER FORMING AN EXTINGUISHING ASH-TRAY

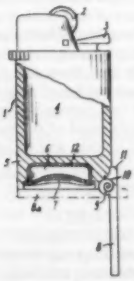
Yves Mazelie, 12, rue Herran, Paris, France

Continuation-in-part of Ser. No. 095,477, Nov. 19, 1979, abandoned, which is a continuation of Ser. No. 815,540, Jul. 14, 1977, abandoned. This application Dec. 11, 1981, Ser. No. 329,893

Claims priority, application France, Jul. 22, 1976, 76 22391; Apr. 20, 1977, 77 11850

Int. Cl.³ A24F *19/10*

U.S. Cl. 131—234 **8 Claims**



1. A lighter with an ash-receiving chamber, comprising:

a body made of a synthetic material and including a fuel storage chamber;

fuel igniting means attached to said body;

container means including a portion of said body and defining an open-ended ash-receiving chamber having a bottom wall and side walls;

extinguishing means coupled to said container means;

a hinged cover pivotally attached to said container means and movable between an open position in which said extinguishing means is exposed to allow the crushing of the burning end of a cigar or cigarette against said extinguishing means, and a closed position in which said cover seals said chamber to smother the ashes and prevent the spilling out thereof;

closure means for normally retaining said cover in said closed position;

manually engagable handle means for defeating said closure means and allowing said cover to move from said closed position to said open position;

wherein said cover is pivotable about a point proximate its center and wherein said closure means includes a recess and an engagable resilient protrusion, one of said recess and said protrusion being located on one end of said cover and the other of said recess and said protrusion being located at a corresponding position on said container means, and wherein said handle means is located on said cover at a point on said cover remote from the pivot point.

4,478,231

APPARATUS FOR SEVERING CIGARETTE RODS OR THE LIKE

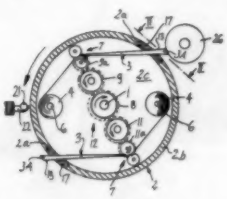
Willy Rudszinat, Dassendorf, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,567

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3025968

Int. Cl.³ A24B *5/28*

U.S. Cl. 131—84 C **20 Claims**

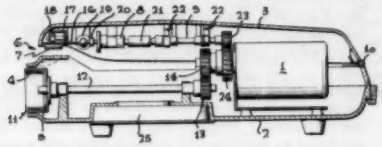


1. Apparatus for subdividing an axially conveyed rod which contains a filler of fibrous material of the like into diecrete rod-like sections, comprising a hollow carrier rotatable about at least one predetermined axis; an elongated flexible band-like knife including a convoluted portion installed in the interior of and supported by said carrier and a leader extending from said convoluted portion, said carrier having an opening through which the leader of said knife extends outwardly and said leader being arranged to sever the rod in response to rotation of said carrier, said knife having an elongated marginal portion which constitutes a cutting edge and that part of said cutting edge which is provided on said leader being arranged to sever the rod in response to rotation of said carrier; feeding means for rotating said convoluted portion in a direction to unwind the knife and to thereby advance fresh parts of said cutting edge through and beyond said opening; and means for removing material from said leader at the rate at which said feeding means rotates said convoluted portion.

4,478,232
NAIL POLISHER

Mieji Yasuda, Kashiwara, Japan, assignor to Nihon Keiki Co., Ltd., Osaka, Japan

Filed Nov. 18, 1983, Ser. No. 553,364
Claims priority, application Japan, Nov. 19, 1982, 57-204240
Int. Cl.³ A45D *29/05*
U.S. Cl. 132—73.6 3 Claims

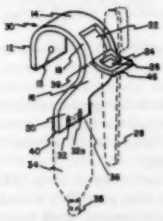


1. A nail polisher comprising:
a case body having therein a single motor;
a cover provided on the case body in a manner to be opened/closed with its rear end as the center of such motion;
a polishing cylinder formed with a polishing layer on its inner surface, said cylinder being at the front portion of the case body in a manner to be rotated by the single motor;
a finger tip inserting space formed between the front end of the case body and the front end of the case;
filing plates which are driven to reciprocate horizontally above the finger tip inserting space, and
transmission shafts which reciprocate the filing plates through a converting mechanism, said filing plates and transmission shafts being provided in the cover so that the transmission shafts connect to the single motor when the cover is closed.

4,478,233
DENTAL HOLDER

David E. Wilkinson, 38338 Glenview Dr., Fremont, Calif. 94536

Filed Apr. 25, 1983, Ser. No. 460,156
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—84 D 10 Claims

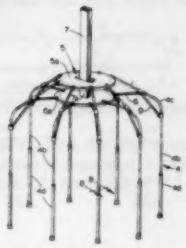


1. A dental holder comprising a rear wall, a midsection and a front wall having an upper portion and a lower portion, said rear wall being adapted to bear against a flat support surface for affixing thereto; said midsection connecting said rear wall to said front wall; said front wall being provided with an aperture and a pivotably mounted flap comprising an opening adapted for passageway and support of a toothbrush.

4,478,234
COLLAPSIBLE FRAME FOR PORTABLE SHELTERS

Anthony V. Bester, 1825 3rd Ave. South, Minneapolis, Minn. 55404

Filed Apr. 30, 1982, Ser. No. 373,657
Int. Cl.³ A45F *1/04*
U.S. Cl. 135—98 5 Claims



1. A collapsible frame for a portable shelter comprising,
an upper supporting ring,
a plurality of bent elements respectively defining planes disposed generally radially of said upper ring and having their upper ends pivotally connected in circumferentially spaced relation around said upper supporting ring,
a lower supporting ring disposed below said upper ring,
a plurality of control links respectively lying generally in the plans defined by said legs and extending between the lower ring and intermediate portions of the leg elements and pivotally connecting said ring and said intermediate leg portions,
an elongated upstanding member having its lower end fixed to the lower ring and slidably extending upwardly through the upper ring to provide a stabilizing slide between the upper and lower rings during erection and collapsing of the frame leg elements,
stop means limiting the upper movement of said upstanding member in erected position, and
wherein both of said support rings are formed from a pair of opposed disc elements having cross pivot elements formed from partially cut away material of said discs to provide the pivot connection with the upper ends of the legs and the inner ends of the control links, respectively.

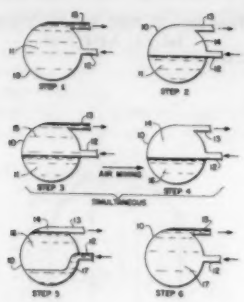
4,478,235
METHOD FOR REGENERATING HYDRAULIC SYSTEMS

Charles C. Chapin, Woodbridge; James H. Conley, Fredericksburg, both of Va., and Robert G. Jamison, Glen Burnie, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1982, Ser. No. 364,119
Int. Cl.³ B08B *7/04*
U.S. Cl. 137—15 12 Claims

1. A method of cleaning and of replacing the hydraulic fluid existing in a hydraulic system, comprising the steps of:
a. initially opening the hydraulic system and generating at least a substantial partial depletion of the fluid by selective means in association therewith, then closing the system;
b. thereafter introducing into said system a density modifier fluid for a first hydraulic fluid contained within said system;
c. then agitating the introduced density modifier fluid and the remaining existing hydraulic fluid so as to form a homogenous mixture thereof;
d. temporarily opening the hydraulic system, and
e. then introducing a second hydraulic fluid into said hydraulic system, said second hydraulic fluid having a density greater than said mixture of said density modifier fluid

and said first hydraulic fluid, whereby said hydraulic system is filled with said second hydraulic fluid while



displacing said mixture of said first hydraulic fluid and density modifier from said hydraulic system.

4,478,236

DISCONNECTOR FOR HYDRAULIC CIRCUITS

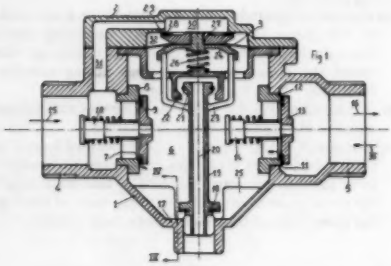
Bernard Neuzeret; Jean Richard, and Jean-Francois Comeau, all of Saone et Loire, France, assignors to Socla, S.A., France

Filed Feb. 18, 1982, Ser. No. 349,748

Claims priority, application European Pat. Off., Jan. 26, 1982, 26/01/1982

Int. Cl.³ F16K *17/04;* **G05D** *7/01*

U.S. Cl. 137—107 **4 Claims**



1. A hydraulic disconnecting apparatus for interposition between an in-flow circuit and an out-flow circuit comprising:

A hollow body having an in-flow conduit and an out-flow conduit co-axial therewith about a flow axis, said conduits being adapted to be connected respectively to and between said in-flow circuit and said out-flow circuit and to flow a liquid under a fluid pressure therebetween and having an intermediate chamber interposed therebetween, said hollow body further having a cover member, an intermediate roof, and a floor, said floor comprising a bottom boundry of said intermediate chamber and having a first discharge aperture therethrough along a discharge axis orthogonal to said flow axis, said first discharge aperture when open communicating said intermediate chamber with the atmosphere, said cover member and said intermediate roof defining a membrane chamber therebetween intersecting said discharge axis, and said intermediate roof having an annular wall depending downwards from said membrane chamber along and about said discharge axis and further having roof opening means spaced radially outboard of said annular wall, said annular wall defining an atmospheric chamber and having a second discharge aperture about said discharge axis, said second discharge aperture when open communicating said atmospheric chamber and said intermediate chamber;

an automatic primary spring valve and an automatic secondary spring valve located along said flow axis on opposite sides of said discharge axis respectively in said in-flow connection conduit and said out-flow conduit;

membrane means vertically movable along said discharge axis and sealingly secured between said cover member and said intermediate roof to divide said membrane chamber into a pressure chamber communicating with said in-flow conduit and a lower chamber communicating with said intermediate chamber through said roof opening means; and

discharge valve means comprising spring means and a tubular member having a lower end and an upper end extending respectively through said first and second discharge apertures to permanently communicate said atmospheric chamber with the atmosphere, said tubular member further having first and second sealing elements spaced axially along said tubular member on opposite sides of said flow axis and adapted to respectively close said first and second discharge apertures, said first sealing element closing said first discharge aperture in a direction with said fluid pressure in said intermediate chamber and said second sealing element closing second discharge aperture in a direction against said fluid pressure, said tubular member having arms means extending radially outwards and upwards about said annular wall and through said roof opening means, said arm means being affixed to said membrane means, whereby said spring means normally urge said membrane means and said tubular member affixed thereto upwards along said discharge axis to open said first and second discharge apertures.

4,478,237

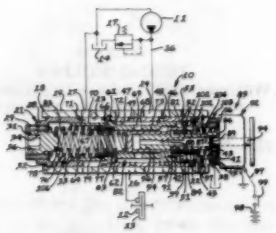
PRESSURE MODULATING AND REDUCING VALVE

William W. Blake, Kewanee, and Alan R. Coutant, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 410,739, Aug. 23, 1982, abandoned. This application Jul. 11, 1983, Ser. No. 512,259

Int. Cl.³ G05D *16/10*

U.S. Cl. 137—116.3 **17 Claims**



1. A pressure modulating and reducing valve (**10**) for communicating pressurized fluid from a source (**11**) to a load chamber (**12**) at a modulated rate of pressure rise and at a reduced pressure, comprising:

a housing (**18**) including a body (**19**) having a bore (**23**) therein and an inlet port (**24**), a load port (**26**) and a drain port (**27**) axially spaced from one another and being in communication with the bore (**23**), and a retainer (**21**) connected to the body (**18**) at one end of the bore (**23**);

a sleeve member (**46**) slidably positioned in said bore (**23**) of said body (**19**) and having a bore (**47**) therein and first and second passages (**48,49**) communicating the bore (**47**) of the sleeve member (**46**) with the inlet port (**24**) and the load port (**26**) respectively;

an end wall (**51**) connected to the sleeve member (**46**) at one end of the bore (**47**) of the sleeve member (**46**);

a pressure reducing valve spool (61) slidably positioned in the bore (47) of the sleeve member (46) for relative movement therebetween;

resilient means (76) for resisting movement of the pressure reducing valve spool (61) toward the retainer (21);

a reaction chamber (81) between the pressure reducing valve spool (61) and the end wall (51);

means (82) for communicating the load port (26) with the reaction chamber (81); and

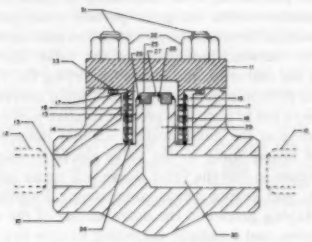
means (103) for selectively moving the sleeve member (46) relative to the pressure reducing valve spool (61) and the body (19) at a modulated rate so that the fluid pressure in the reaction chamber (81) and the load port (26) increases and reacts against the pressure reducing valve spool (61) moving it against the resilient means (76) to establish a pressure proportional to the movement of the sleeve member.

4,478,238

CONDENSATE REMOVAL DEVICE

James W. Maddox, Newport News, and David D. Berger, Alexandria, both of Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 25, 1981, Ser. No. 305,766
Int. Cl.³ F16T *1/34*
U.S. Cl. 137—171 **3 Claims**



1. In a device for removing condensate from a vapor conduit in a pressurized vapor system containing a working fluid, which device comprises a rigid, stationary orifice in unit with a cylindrical strainer, said cylindrical strainer being positioned:

a. upstream of said orifice for preventing passage of particles larger than said orifice,

b. generally off the axis of said vapor conduit,

c. with its longitudinal axis generally transverse to that of said vapor conduit and arranged such that said fluid enters the sides of said cylindrical strainer and exits the end,

the improvement wherein:

said unit comprises a body and a separable cap, said cylindrical strainer being rigidly attached at one end to said cap;

said body contains a working fluid inlet passage, a tubulate orifice plate support attached at one end to said body, an annular chamber surrounding and concentric with said tubulate orifice plate support, and a working fluid outlet passage;

the distal end of said strainer is seated in fluid sealing relationship with said body proximate the base of said tubulate orifice plate support when said cap is attached in fluid sealing relationship to said body, said cap and cylindrical strainer thereby dividing said annular chamber into an outer chamber bounded by said body, said strainer and said cap and an inner chamber bounded by said strainer, said tubulate orifice plate support, said orifice plate and said cap;

said orifice plate is rigidly attached to the distal end of said tubulate orifice plate support and concentric therewith;

said orifice plate contains an orifice concentric therewith;

said tubulate orifice plate support is of such length that said orifice is positioned proximate the end of said cylindrical strainer which is remoter from said vapor conduit such that erosion of said body under said orifice by fluid flowing through the orifice is minimized, and such that said orifice is positioned out of a direct line from any of the openings in said strainer;

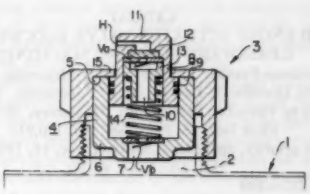
and said outer chamber is in direct flow communication with said inlet passage and said inner chamber is in flow communication through said orifice with said outlet passage.

4,478,239

FUEL TANK LID

Akira Nagashima, 1-12, Higashimonzen-2-chome, Kawasaki-ku, Kawasaki-shi, Japan

Filed Sep. 15, 1982, Ser. No. 418,154
Claims priority, application Japan, Jul. 7, 1981, 56-100231[U]
Int. Cl.³ B65D *83/14*
U.S. Cl. 137—209 **2 Claims**



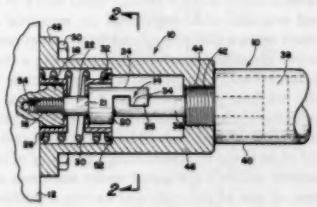
1. A fuel tank lid comprising a manually operable air pressurizing pump for pressurizing the air in a fuel tank thereby to improve the start up characteristic or to eliminate any trouble due to shortage of fuel in a small-sized internal combustion engine for driving machines for various works, said air pressurizing pump including an inner lid, a discharge vent valve fitting to a discharge vent hole formed in the bottom of said inner lid, and a piston slidably received in an internal cavity of said inner lid, said piston having an end projecting to the outside of the tank lid and an internal cavity being communicated with the exterior of said tank through a filter and a suction vent valve which are secured in said piston by a piston spring.

4,478,240

AIR PILOT VALVE CONTROLLER

William D. Tanner, 3154 E. 26th, Tulsa, Okla. 74114

Filed May 3, 1982, Ser. No. 373,973
Int. Cl.³ F16K *43/00, 31/122*
U.S. Cl. 137—315 **3 Claims**



1. In combination with a hydraulic valve having a reciprocal spool member, a fluid actuated control device comprising spring urged coupler bolt means secured directly to the spool member, an independent reciprocal piston having rod means operably and releasably engaged to the coupler bolt means for reciprocation thereof, end cap means secured to the valve for

encasing the coupler bolt means and supporting the piston rod means a piston operator housing encasing the reciprocal piston and at least a portion of the piston rod means, upon installation said piston housing being secured to the end cap through an opening in the end cap through rotation of said piston housing in one direction for engaging the at least other portion of the piston rod means to the coupler bolt means, upon removal of the operator housing from the end cap said operator housing is rotated in an opposite direction to first disengage the at least other piston rod means portion from the coupler bolt means within the end cap so that the operator housing, the reciprocal piston and the piston rod means can be removed from the end cap as a single unit without disturbing the other components of the hydraulic valve, the spring urged coupler bolt means includes helical spring means surrounding at least a portion of the coupler bolt means, and a pair of spaced oppositely disposed spring retainer cup means cooperating with the end cap means for limiting the movement of the coupler bolt in opposite reciprocal directions.

4,478,241

SOLENOID ACTUATED VALVE BLOCKS FOR GLASSWARE FORMING MACHINES

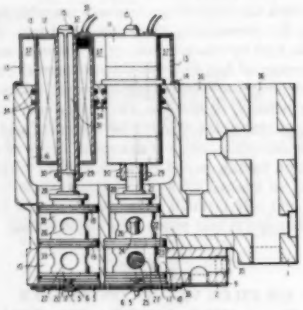
Luis Cardenas-Franco; Enrique Veazey-Menéndez, and Jorge Alfredo Heredia-De-La-Paz, all of Monterrey, Mexico, assignors to Vitro-Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 15, 1981, Ser. No. 330,918

Claims priority, application Mexico, Dec. 16, 1980, 185295

Int. Cl.³ F16K *49/00*

U.S. Cl. 137—340 **8 Claims**



1. A solenoid actuated valve block for glassware forming machines, which comprises the combination of a metal block provided with an inner longitudinal operational air manifold; a plurality of valve chambers arranged in a staggered array and opening towards a lower surface of said metal block at one of their ends and towards said operational air manifold at the other one of their ends; a plurality of cartridge valves arranged within said valve chambers, each chamber having a duct for operational air individually connected with a pneumatic operative line of the machine and an exhaust duct arranged at 90° thereto and opening to the atmosphere; a plate cover attached to said lower surface of said metal block to cover said valve chambers, said plate being provided with a plurality of manual pilot push buttons which are situated under each one of said valve chambers at one of the ends and having a pushing rod which is coupled to one end of a plunger of each cartridge valve for manual operation thereof; a plurality of solenoids arranged through bores provided in an upper face of said metal block and crossing said operational air manifold, said solenoids having a piston coupled with the opposite end of the plunger of each cartridge valve for actuation thereof; and a closed chamber on the upper face of said metal block and housing all the solenoids to form a cooling manifold therefor.

4,478,242

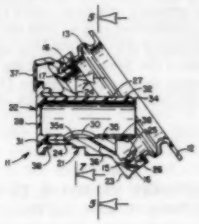
FINGER-ACTUATED PUSH-PULL SLIDEABLE DISPENSING VALVE

Curtis J. Bond, Worthington, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio

Filed Aug. 25, 1983, Ser. No. 526,330

Int. Cl.³ F16K *35/00*

U.S. Cl. 137—383 **8 Claims**



1. A valve assembly comprising a guide portion and a valve sleeve closed at its outer end and open at its inner end telescoping slideably therein; said guide sleeve having a radially-directed dispensing outlet movable axially-outwardly beyond the guide portion to open dispensing position from closed sealed position within the guide portion, a tamper-proof seal strip connected between the guide portion and the valve sleeve to prevent outward movement of the valve sleeve without breaking the seal strip, and means for keying the valve sleeve and guide portion together to permit sliding movement of the valve sleeve but to normally prevent rotative movement of the valve sleeve in the guide portion without the application of sufficient torque force to the valve sleeve to overcome the keying means so that the valve sleeve will rotate and break the seal strip; said keying means comprising a longitudinally extending keying groove in the outer surface of the wall of the valve sleeve, and a radially extending flexible key carried by the guide portion and extending into the groove, said groove extending only partially radially through said valve sleeve wall.

4,478,243

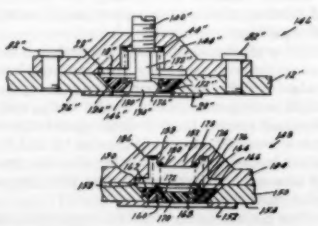
VALVE ASSEMBLY

Robert W. King, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 430,322, Sep. 30, 1982, Pat. No. 4,445,534, which is a division of Ser. No. 219,849, Dec. 23, 1980, Pat. No. 4,368,755, which is a continuation of Ser. No. 971,309, Dec. 20, 1978, abandoned. This application Dec. 22, 1983, Ser. No. 564,283

Int. Cl.³ F16K *15/08*

U.S. Cl. 137—512.1 **29 Claims**



1. An improved pressure responsive valve assembly comprising:

a valve plate having an inner surface in part defining a compression chamber;

a discharge valve seat opening extending through said valve plate, said valve seat opening being defined by an outwardly diverging conical sidewall;

a frusto conical discharge valve member disposed within said opening and having a peripheral edge surface of conical configuration adapted to sealingly engage said sidewall of said valve seat opening,

said conical peripheral edge surface of said discharge valve member having an included angle when unstressed which is greater than the included angle of said conical sidewall of said valve seat opening; and

means defining an opening through said discharge valve member, and sealing means sealingly engaging the sidewall of said opening in said valve member when said discharge valve member is in a closed position so as to prevent fluid flow through said discharge valve seat opening, said sealing means and discharge valve member being movable relative to one another to allow additional discharge fluid flow when said discharge valve member is in an open position.

28. A discharge valve assembly for use in a gas compressor having a valve plate equipped with an inner surface in part defining a compression chamber, a discharge port extending through said valve plate and defining a valve seat diverging outwardly from said inner surface, said discharge valve assembly including a first valve element having an outwardly diverging first seating surface and a coaxial port extending therethrough, said coaxial port defining by a second seating surface diverging outwardly from said inner surface and adapted to engage a second valve element, said first and second valve elements being composed of a relatively compliant material and being capable of distorting to conform to said valve seat and said second seating surface, respectively, with an inner surface of said first and second valve elements lying substantially in the plane of said inner surface of said valve plate when the discharge valve assembly is closed, said distortion resulting in a reactive force tending to unseat said first and second valve elements.

4,478,244

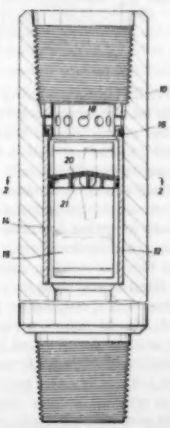
MUD SAVER VALVE

William R. Garrett, P.O. Box 671, Coldspring, Tex. 77331

Filed Jan. 5, 1983, Ser. No. 455,809

Int. Cl.³ F16K *15/00*

U.S. Cl. 137—515 **1 Claim**



1. A mud saver valve for being received into a tubular drill pipe subassembly, comprising:

(a) a housing having a flow-through opening longitudinally aligned with the bore opening of the drill pipe assembly;

(b) a butterfly disc pivotally mounted across said opening;

(c) a rotating axis for pivotally mounting said disc, at least one end of which extends through the side wall of said housing to form an axis extension;

(d) spring means mounted to said axis extension for providing biasing torque for operating said disc closed, opposing operating pressure through said flow-through opening causing excess biasing torque to be required for operating said disc open;

(e) a drive pivot arm connected to said axis extension, said spring means being mounted to axis extension via said drive pivot arm;

(f) the second end of said rotating axis extending through the housing side wall to form a second axis extension, and including a second drive pivot arm connected to said second axis extension, and second spring means mounted to said second drive pivot arm for providing additional biasing pressure for operating said disc closed, opposing operating pressure through said flow-through opening in excess of said biasing pressure provided by said first-named spring means and said second spring means being required for operating said disc open;

(g) said housing including a first side pocket for accommodating said first-named drive pivot arm in said first-named spring means and a second side pocket for accommodating said second drive pivot arm and said second spring means;

(h) said spring partially laterally moving with the opening of said disc and the rotation of said first-named drive pivot arm and said second drive pivot arm; and

(i) a stop included in said first side pocket for limiting the lateral movement of said first-named spring, thereby providing more lateral movement of said second spring than said first-named spring with the opening of said butterfly disc and providing torque to said axis to substantially prevent fretting of said butterfly disc while in the open position.

4,478,245

ELECTRICALLY CONTROLLABLE VALVE ASSEMBLY

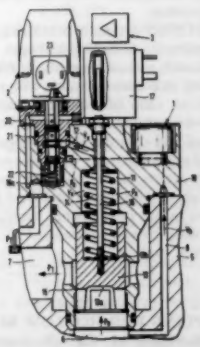
Bernd Bender, Lich, Fed. Rep. of Germany, assignor to Vickers, Incorporated, Troy, Mich.

Filed Aug. 25, 1982, Ser. No. 411,513

Claims priority, application European Pat. Off., Sep. 2, 1981, 81106845.1

Int. Cl.³ F16K *37/00, 31/40*

U.S. Cl. 137—554 **10 Claims**



1. An electrically controllable valve assembly including:

a displaceable piston as the member to be adjusted,

a pilot valve for controlling the position of the piston, and

an electronic controller for controlling the pilot valve, wherein

a first force producing means is provided to act on one area of said displaceable piston,

a second force producing means is provided to act on an opposing area of said displaceable piston, said second force being produced at least partly hydraulically by pressure in a control chamber;

wherein said pilot valve comprises:

a restrictor means array for a bleed flow from a main delivery line to a tank line,

a spool for adjusting the restrictor means array, and

an electrically actuable control member for adjusting the position of said spool of said pilot valve;

wherein said restrictor means array includes:

a first variable restrictor means disposed between a branch duct of a main delivery line and a control line connecting said control chamber and said pilot valve, and

a second variable restrictor means disposed between said control line and a low-pressure chamber, the low pressure urging said spool in the direction of return movement thereof, and

a third, permanently effective fixed restrictor means between said low-pressure chamber and said tank line.

4,478,246

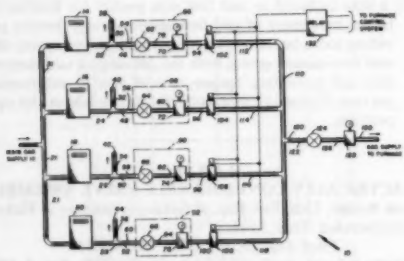
METHOD AND APPARATUS FOR PROPORTIONING OF FUEL USAGE BY A FLUID FUELED APPARATUS

Donnell Sherrod, 327 Allendale St., Baltimore, Md. 21229

Filed Aug. 10, 1981, Ser. No. 291,515

Int. Cl.³ F16K *37/00*; F17D *1/04*

U.S. Cl. 137—557 **19 Claims**



1. a fluid proportioning system for use with a fluid fueled apparatus and a plurality of discrete fluid supplies comprising:

a manifold having a plurality of inputs and an output adapted to be in communication with the fluid input of said fluid fueled apparatus;

a plurality of fluid pressure measuring and fluid pressure varying means each having an input and an output, said outputs of each of said plurality of fluid pressure varying means being in communication with one of said inputs of said manifold, each of said fluid pressure measuring and fluid pressure varying means inputs being in comunication with one of said discrete fluid supplies; and

a plurality of simultaneously operable valve means, each of said valve means being operably connected to and in communication with one of said fluid supplies, said plurality of valve means being either simultaneously opened or simultaneously closed for selectively isolating said fluid supplies from each other.

4,478,247

FLUID COUPLING FOR HOLLOW ROTARY MEMBER

Franz Alber, Plattlgasse 12, Wien 23, Austria

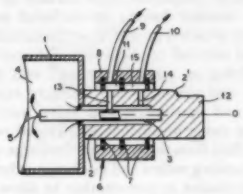
Filed Jan. 25, 1982, Ser. No. 342,394

Claims priority, application Austria, Jan. 26, 1981, 324/81

Int. Cl.³ E03B *1/00*

U.S. Cl. 137—580 **5 Claims**

1. In combination, a hollow rotary member provided with a shaft having a bore communicating with the interior of said member, and a stationary coupling sleeve coaxially surrounding said shaft with annular clearance, said sleeve beng internally provided with a plurality of elastomeric sealing rings engaging said shaft and bounding at least one compartment within said clearance communicating with said bore through a lateral port of said shaft and further communicating with an external conduit carrying a temperature-controlling fluid circulated through said member by way of said bore, said shaft



having a free end constituted by an integral extremity of reduced cross-sectional area and limited axial length with a noncircular outline formed from convex sections merging smoothly and without peripheral discontinuities into one another, the maximum distance of said sections from the shaft axis beng at most equal to the radius of said shaft, said extremity being joined to adjacent shaft portions by rounded transition zones enabling said sealing rings to be safely fitted onto the shaft from said free end during assembly.

4,478,248

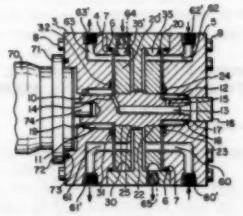
ROTARY VALVE

Donald L. DeVall, 1082 Charles Ave., and Hu D. DeVall, Rte. 1, Box 362-A, both of Morgantown, W. Va. 26505

Filed Jan. 20, 1983, Ser. No. 459,475

Int. Cl.³ F15B *13/042*

U.S. Cl. 137—624.13 **12 Claims**



1. A rotary valve including a housing, said housing having a center section and an end section attached to each end of said center section, seal means located between the ends of said center section and said end sections, a shaft extending axially through said center section into said end sections, bearing means in each of said end sections rotatably supporting an end of said shaft, said center section and said end sections cooperating with said shaft to define a pair of individual chambers within said housing, a cylindrical rotor having opposed substantially parallel faced located in each individual chamber, said rotors being fixed to said shaft for rotation with said shaft relative to said housing, a continuous groove formed in the periphery of each of said rotors, a plurality of radially and angularly spaced arcuate slots formed in each face of each of said rotors, a plurality of passages formed in each of said rotors, said passages intersecting said arcuate slots and said continuous groove to connect arcuate slots with other arcuate slots and with said continuous groove, passageways formed in said end sections, said passageways having a first end opening into one of said individual chambers and selectively aligned with arcuate slots in said rotors when said rotors rotate with

said shaft and a second end opening out of said housing, a plurality of ports formed in said center section of said housing extending between one of said individual chambers and the exterior of said housing, and drive means connected to an end of said shaft to rotate said shaft and said rotors to move said arcuate slots into and out of alignment with the first ends of said passageways formed in said housing end sections.

4,478,249

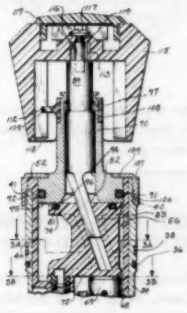
FLUID CONTROL VALVE

Gary A. Fleischmann, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Continuation of Ser. No. 311,519, Oct. 15, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 577,722

Int. Cl.³ F16K *11/06*

U.S. Cl. 137—625.4 **2 Claims**



1. A fluid proportioning valve, comprising:

a housing having a mixing chamber therein, first and second valve seats in the bottom of the mixing chamber that are laterally spaced from one another to provide inlet openings communicating with said chamber, and an outlet opening exiting from said chamber;

a valve member in said chamber having a lower sealing surface in slideable contact with said valve seats, porting means controlling the flow of water from said inlet openings to said outlet opening, and an aperture which is open at the upper surface of the valve member;

said porting means comprising a kidney shaped hole in the bottom of said valve member, a transverse passage through said valve member, and a recess cut along the back bottom edge of said valve member, whereby upon appropriate positioning of the valve member, fluid may pass through said kidney shaped hole, through said transverse passage, and past said recess to reach the outlet;

a bearing member mounted over said valve member which has an axial bore; and

an actuator having an upper stem section rotatably and axially movable in said bore and a lower cam section slideably extending into said valve member aperture, whereby axial movement of the stem section causes the cam to contact a wall of said aperture, thereby causing the valve member to slide laterally over said valve seats to control fluid volume, and rotation of said stem section causes said valve member to rotate, thereby controlling the proportion of fluid entering from each inlet opening.

4,478,250

PRESSURE CONTROL VALVE

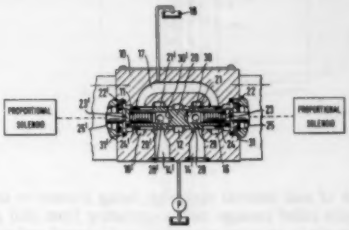
Wolfgang Lukasczyk, and Roland Ewald, both of Lohr am Main, Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr am Main, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,938

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114437

Int. Cl.³ F15B *13/044*

U.S. Cl. 137—625.65 **17 Claims**



10. A pressure control valve construction comprising a valve body having an inlet port adapted for connection to a pressure source, a pair of working ports adapted for connection to respective loads and a pair of outlet ports connected to a reservoir, control spool means movably mounted in said body and including lands for respectively controlling communication between said inlet port and respective ones of said working ports and between said working ports and said outlet ports, said control spool means comprising a control spool having opposite ends and blind bores respectively in said ends, sensing spools respectively movably mounted in said blind bores to define spaces between the bottoms of said blind bores and said sensing spools, said control spool having respective openings connecting said spaces with respective working ports, and actuator means for applying an actuating force to at least one of said sensing spools for moving the same and the control spool therewith, said actuator means comprising a proportional solenoid connected to apply the actuating force to said one sensing spool in response to a control current supplied to the solenoid, said one sensing spool in turn applying the actuating force to the control spool which automatically adjusts itself to provide and maintain a predetermined working pressure for the valve.

4,478,251

ORIFICE FITTING SEAL ASSEMBLY

Ruben Sanchez, Katy, and R. M. McEver, Jr., Houston, both of Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Aug. 2, 1982, Ser. No. 404,429

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—44 **15 Claims**

1. In an orifice fitting mechanism for use in controlled metering of fluids and having a body structure defining a flow passage and opposed spaced sealing surfaces surrounding said flow passages, forming a continuous conduit and supporting an apertured orifice plate in the flow passage, the improvement comprising:

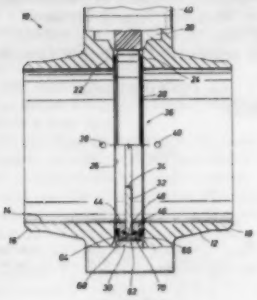
(a) a pair of internal seal rings cooperating to define a plate receptacle within which said orifice plate is positioned said internal seal rings each defining peripheral locking means;

(b) external locking means surrounding said internal seal rings and retaining said internal seal rings in assembly;

(c) first seal means for establishing sealed relation between said internal seal rings and said orifice plate;

(d) second seal means for establishing sealed relation be-

tween said internal seal rings and said sealing surfaces of said body structure; and



(e) each of said internal seal rings being formed to define pressure relief passage means extending from said plate receptacle to an outer portion of said internal seal rings.

4,478,252

DEVICE FOR ENCLOSING OBJECTS

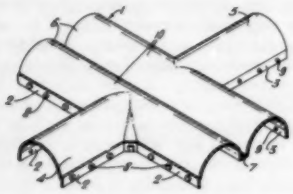
Robert H. McLoughlin, Highworth, Nr. Swindon, England, assignor to Raychem Ltd., United Kingdom

Filed Jan. 28, 1982, Ser. No. 344,269

Claims priority, application United Kingdom, Feb. 5, 1981, 8103625

Int. Cl.³ F16L *55/00*; H01B *17/00*

U.S. Cl. 138—140 **24 Claims**



10. A dimensionally-recoverable device for enclosing at least part of an elongate object, the device having closure portions that can be retained together by means of a closure arrangement which comprises a closure element located on each closure portion, the closure element on each closure portion being engageable with the closure element on the other closure portion, and a retaining element for retaining the closure elements in engagement, the closure elements and retaining element being arranged so that the retaining element can be twisted about the closure elements to lock the closure elements together.

4,478,253

EROSION RESISTANT ELBOW FOR SOLIDS CONVEYANCE

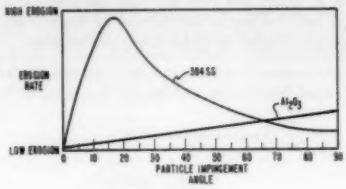
James W. Everett, New Stanton, Pa., assignor to KRW Energy Systems Inc., Houston, Tex.

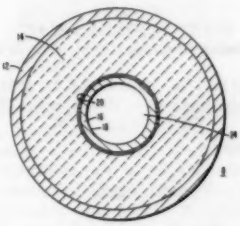
Filed Apr. 8, 1983, Ser. No. 483,404

Int. Cl.³ F16L *9/04*, *55/00*

U.S. Cl. 138—140 **5 Claims**

1. An elbow for use in particulate material conveyancing comprising: an outer pipe having a radius of curvature R; an inner pipe having an internal radius r, a radius of curvature R, and concentric with and internal to said outer pipe, said inner pipe comprising an outer layer comprised of a first material and an inner layer comprised of a second material; wherein said first material is characterized by high erosion resistance when impinged by particulate material and wherein said second material is characterized by high tensile strength and





flexibility; and, inner pipe supporting means for providing support to said inner pipe, said means disposed between said inner pipe and said outer pipe.

4,478,254

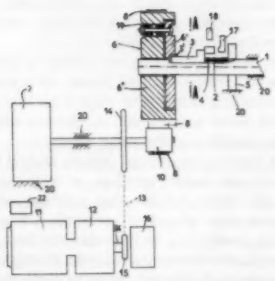
DEVICE FOR ACTUATING SHEDDING MOTION SEARCHING AND SLOW SPEED OPERATION ON A LOOM

Michel Beaudoux, Didenheim, and Jean-Pierre Vuillet, Mulhouse, both of France, assignors to Societe Alsacienne De Constructions Mecanniques De Mulhouse, Mulhouse, France

Filed Dec. 28, 1981, Ser. No. 335,254

Int. Cl.³ D03D *51/08*

U.S. Cl. 139—1 E **6 Claims**



1. In a loom having a main shaft adapted to be rotatably driven, a dobby, and first connecting means for operatively connecting said main shaft to said dobby, the improvement for controlling both shedding motion searching and slow speed operation wherein: said first connecting means comprises a pulley rotatably mounted on said main shaft; a key slot in one face of said pulley; a keyway in said shaft positioned to register with said key slot; at least one key slidably arranged in said keyway to releasably engage in said key slot to interlock said pulley with said shaft; resilient means adapted to urge said key

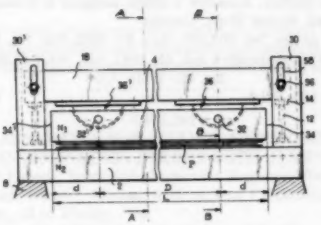
into engagement in said key slot; means adapted to disengage said key from said key slot; an auxiliary gear-motor; second connecting means operatively connecting said gear-motor to said dobby; clutch means operatively associated with said second connecting means to connect said gear-motor to said dobby; detector means operatively associated with said key and said gear-motor to detect the position of said key with respect to said key slot and to control said gear-motor in response thereto; so that said gear-motor drives said dobby alone when said key is disengaged from said key slot and drives said dobby and loom together in unison at slow speed when both said key and clutch means are respectively engaged and said main shaft is not driven.

4,478,255

DEVICES FOR CUTTING PILE THREADS IN A LOOM FOR WEAVING VELVET IN A DOUBLE LAYER

Yves Juillard, Mulhouse, France, assignor to Societe Alsacienne de Construction de Materiel Textile, France

Filed May 12, 1983, Ser. No. 493,979
Claims priority, application France, May 26, 1982, 82 09115
Int. Cl.³ D03D *39/18*
U.S. Cl. 139—21 **11 Claims**



1. A device for cutting pile threads in a loom for weaving velvet in a double layer and comprising a table for supporting the bottom layer, a rule for retaining the top layer, a rule-reinforcement bar fixed at both ends in a manner which permits height adjustment on two vertical side members rigidly fixed to the frame of the loom, and a pile cutting member which produces action opposite to the space formed between the table and the rule, wherein said rule is suspended from the reinforcement bar and is anchored solely to its reinforcement bar at two points which are distant from the ends of said rule, and wherein no means are provided for attaching the ends of said rule to the vertical side members aforesaid.

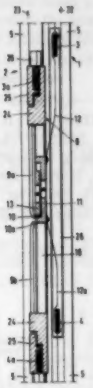
4,478,256

APPARATUS FOR PRODUCING A SELVAGE PROVIDED WITH A CROSSWEAVE

Heinz Klocker, Borken, Fed. Rep. of Germany, assignor to Gebr. Klocker (Klocker Bros.), Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 457,889
Int. Cl.³ D03C *11/00, 7/06*
U.S. Cl. 139—54 **8 Claims**

1. Apparatus for producing a selvage provided with a crossweave, comprising two reciprocally movable weaving shafts, a needle holder on one of said weaving shafts, a main rail with a diagonal slit on the other of said weaving shafts, a header rail movably supported adjacent the main rail for limited travel, said header rail having a diagonal slit which overlaps the diagonal slit in the main rail and elastic connection means joining the main rail to said other weaving shaft for providing normal conjoint travel thereof and being flexible to prevent



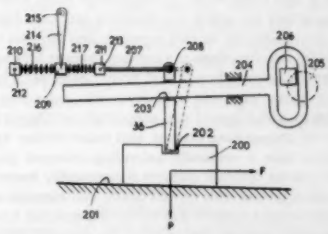
rupture of said connection means due to high inertial forces at high speeds of travel of said main rail and said weaving shafts.

4,478,257

DEVICE FOR REGULATING THE TENSION OF WARP THREADS IN A WEAVING LOOM

Yves Juillard, Mulhouse, France, assignor to Societe Alsacienne de Construction de Materiel Textile, France

Filed Dec. 9, 1982, Ser. No. 448,411
Claims priority, application France, Dec. 23, 1981, 81 24098
Int. Cl.³ D03D *49/06*
U.S. Cl. 139—110 **15 Claims**



1. An assisted mechanical control device for actuating a controlled element in dependence on the displacements of a movable sensing element, especially in order to actuate the regulating element of the speed-changing unit of a warp-beam let-off motion of a weaving loom in accordance with the displacements of the balance for measuring the tension of the warp threads, wherein said device comprises:

a bar of substantial length which is displaced in reciprocating motion substantially in the direction of its length by means of a driving power source;

a jamming member adapted to slide and to be selectively jammed against said bar according to the position of said member with respect to said bar;

a first coupling system for connecting the sensing element to said jamming member in order to modify the position of said member with respect to said bar as a function of the displacements of the sensing element;

and a second coupling system for connecting said jamming member to the controlled element, the driving power

required for displacement of said controlled element being supplied by said driving power source.

4,478,258

WARP STOP MOTION DEVICE OF A WEAVING MACHINE

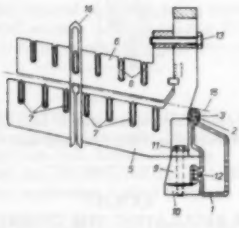
Bernhard Koch, Horgenberg, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Sep. 29, 1982, Ser. No. 426,654

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149219

Int. Cl.³ D03D *51/30*

U.S. Cl. 139—358 **2 Claims**



1. In a weaving machine having a warp stop motion device which includes upper and lower vertically aligned supports for respectively supporting contact bars and guide bars lying perpendicular thereto, drop wires guided on said contact bars and between adjacent pairs of said guide bars, warp ends extending parallel to upper supports and through eyelets provided in said drop wires, a longitudinal beam which functions as a structure on which the supports are mounted, said beam lying perpendicular to said supports and parallel to said bars, said beam also functions as a contact support for the warp ends, the improvement wherein said beam comprises a hollow body having along one side a horizontally extending dovetailed portion to which one of said supports is cantilever mounted by means of cooperating clamps, said beam further having along its upper side a vertically extending crimped portion about which a wear resistant element is removably mounted entirely between opposite ends of said beam, said element solely defining said contact support and being of a material having a hardness greater than the hardness of the material of the beam.

4,478,259

REED FOR JET WEAVING MACHINES

Rolf Honegger, Durnten, Switzerland, assignor to Ruti Machinery Works, Ltd., Ruti, Switzerland

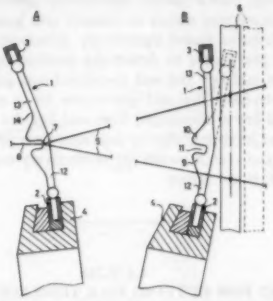
Filed Feb. 26, 1982, Ser. No. 352,559

Claims priority, application Switzerland, Mar. 5, 1981, 1466/81

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **4 Claims**

1. A reed dent for beating up a weft thread for jet weaving machines, said reed dent having a recess on a forward edge and disposed interiorly within the warp shed during weft insertion and arranged for guiding a weft thread, the reed dent including two arms which are mutually inclined and which include an angle of less than 180° on the forward edge of the reed dent, said recess is U-shaped and is formed by two generally parallel side edges and a base connecting said two side edges, said base edge being provided for beating-up the weft thread and said



two side edges being disposed generally perpendicularly to the longitudinal direction of the lower of said arms.

4,478,260

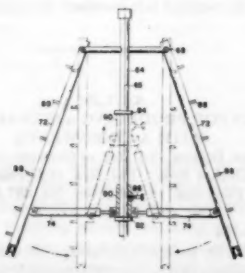
WIRE BASKET, APPARATUS AND METHOD

Manfred Eichler, Ancaster, Canada, assignor to Braun Nursery Limited, Mount Hope, Canada

Division of Ser. No. 293,607, Aug. 17, 1981, Pat. No. 4,403,447. This application Jul. 21, 1983, Ser. No. 515,687

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.1 **11 Claims**



1. A method of making a tubular wire grid from a continuous length of wire, comprising:

laying the wire continuously in back and forth bights on a mandrel, while supporting the wire at the ends of said

bights, thereby forming a tubular cage consisting of a continuous wire strand,

helically coiling the wire across said bights thereby forming a continuous helical wrap,

joining the wire at the crossing points of the wrap and the bights, and

removing the mandrel.

7. A collapsible mandrel for use in making a tubular wire grid consisting of a continuous length of wire, comprising:

a central shaft defining a longitudinal axis,

a hub member mounted on said shaft adjacent one end thereof,

a plurality of radial arms pivotally connected at one end to said hub member for pivotal movement in radial planes toward and away from said shaft, the arms being circumferentially spaced around the shaft,

a first set of circumferentially spaced wire-receiving guide members mounted on said hub member,

a second set of circumferentially spaced wire-receiving guide members mounted on said arms, each of said second set of guide members being mounted on a respective one of said arms at the end remote from said one end, said guide members being adapted to support a wire laid thereon in back and forth bights,

a plurality of wire engaging pegs mounted on each arm, said pegs being adapted to support a wire helically coiled about said arms,

a sleeve member slidably mounted on said shaft,

means for selectively locking the sleeve member to the shaft, and

linkage means interconnecting the sleeve member with said arms for expanding and collapsing the mandrel in response to sliding movement of the sleeve member on said shaft.

4,478,261

APPARATUS FOR FILLING ARTIFICIAL INSEMINATION STRAWS WITH SEMEN

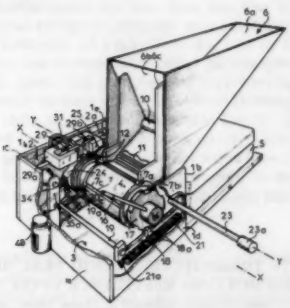
Bertrand Cassou, Saint Symphorien les Bruyères; Robert Cassou, and Maurice Cassou, both of Rue Clémenceau, 61300 L'Aigle, all of France

Filed Feb. 16, 1982, Ser. No. 349,357

Claims priority, application France, Feb. 20, 1981, 81 03353; Sep. 21, 1981, 81 17806

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—2 **12 Claims**



12. A method for filling a straw with semen, comprising the following steps:

(a) placing the straw in a straw dispenser;

(b) transferring the straw from said straw dispenser to a peripheral slot in a substantially cylindrical drum;

(c) mechanically rotating said drum about its longitudinal axis to advance said slot and the straw from a dispensing position proximate to said straw dispenser to a filling position angularly displaced therefrom;

(d) mechanically positioning a nozzle into fluid communication with the straw;

(e) mechanically peristaltically pumping semen through said nozzle into the straw; and

(f) removing the filled straw using a straw holder suitable for ejecting the semen within the straw into the ovaduct of an animal, wherein the filling of the straw with semen and removal of the filled straw do not necessitate the touching of the straw by an operator.

4,478,262

APPARATUS FOR FILLING PORTIONS OF LOOSE MATERIAL INTO PACKAGING CONTAINERS

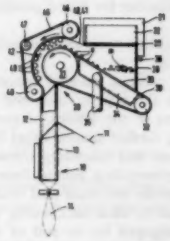
Hugo Auer, Schwaz/Tirol, Austria, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,739

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142221; Mar. 19, 1982, 3210102

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—114 **11 Claims**



1. An apparatus for filling measured portions of loose material in packaging containers, comprising a measuring apparatus for pouring out the measured product portions in increments and having a substantially vertical filling pipe leading to a packaging container, a rapidly-moving conveyor belt (30) leading to the filling pipe (12) disposed beneath the measuring apparatus (22), and means adjacent the measuring apparatus (51, 53, 55) for sequentially transferring the pieces (a) of a single measured product portion (m) contained in the measuring apparatus to the conveyor belt, beginning with those pieces which are located in the measuring apparatus closest to the filling pipe.

4,478,263

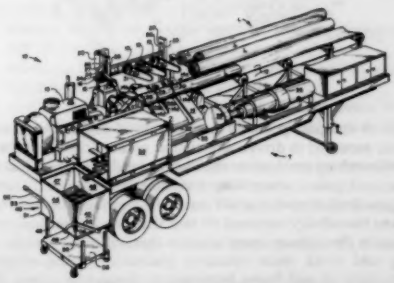
LOG SPLITTER

James L. Johnston, P.O. Box 1209, El Granada, Calif. 94018

Filed Mar. 23, 1983, Ser. No. 477,946

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—3 K **6 Claims**



1. A wood processing machine comprising

an endless conveyor adapted to receive logs to be cut into log segments;

switch means to stop the endless conveyor when a log has been positioned to be cut into log segments;

a trough receiving a log to be cut from the conveyor, said trough including, spaced apart fingers forming a portion of a log supporting surface of the trough;

saw means arranged to simultaneously provide a plurality of cuts through a log in the trough and to move between said fingers, whereby a plurality of log segments are formed in the trough;

a receiving chamber;

means for pivoting said fingers to simultaneously discharge said plurality of cut log segments from the trough to the receiving chamber with said log segments in axially aligned relationship in the receiving chamber;

a log segment splitter aligned with the receiving chamber; and

ram means aligned with the receiving chamber and the log segment splitter, whereby operation of the ram means will force the log segments sequentially through the log segment splitter.

5. A splitter chamber for wood processing machines including

top, bottom and side walls an open entrance end and an open discharge end;

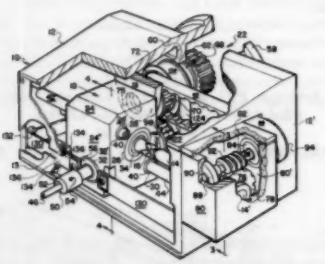
a plurality of pairs of parallel spaced apart cutter knives fixed within the top, bottom and side walls, and with cutting edges of the knives of each succeeding pair of knives being further spaced apart from the knives of the preceding pair and extending transverse to, immediately behind the preceeding pair to form a grid pattern when viewed from the entrance and discharge ends, whereby cutting edges of each succeeding pair of knives are sequentially engaged by an end of a log segment forced through the splitter chamber from the entrance end to the discharge end.

4,478,264

MORTISING APPARATUS

Claud T. Miller, and Larry W. Miller, both of Statesville, N.C., assignors to McKnight-Miller Company, Inc., Statesville, N.C.

Filed Aug. 11, 1982, Ser. No. 407,258
Int. Cl.³ B27F *5/02*
U.S. Cl. 144—83 **13 Claims**



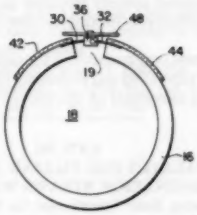
13. A compact portable mortising head adapted to be selectively mounted in driven association with a driving motor of a woodworking machine or the like for cutting longitudinal slots in a work piece, comprising a substantially enclosed frame, a longitudinal, threaded shaft rotatably journaled in said frame, means threadedly mounted on said shaft for longitudinal reciprocation therealong upon rotation thereof, bit means for cutting said work piece rotatably journaled in and extending outwardly of said frame from said reciprocation means about an axis transverse to said threaded shaft, a drive shaft rotatably journaled in said frame, mounting means for operatively connecting said drive shaft in driven relation with said driving motor, and drive connection means operatively associating said drive shaft in driving relation respectively with said threaded shaft and with said bit means for simultaneously rotating each thereof upon rotation of said drive shaft to cause said reciprocation means to reciprocate longitudinally along said threaded shaft while causing said bit means to rotate in said reciprocation means, said drive connection means including first means driven by said drive shaft for rotating said threaded shaft and second means driven by said drive shaft for rotating said bit means and said second driven means including idler means reciprocably translatable with said reciprocation means for maintaining uniform driven association between said drive shaft and said bit means throughout reciprocation thereof, thereby for cutting longitudinal slots with said bit means.

4,478,265

REUSABLE INSULATING JACKET FOR BEVERAGE CONTAINERS

David DeMarco, Austin, Tex., assignor to Cool-Zip Inc., Austin, Tex.

Continuation-in-part of Ser. No. 305,893, Sep. 25, 1981,. This application Jan. 19, 1983, Ser. No. 459,259
Int. Cl.³ B65D *23/08*
U.S. Cl. 150—52 R **12 Claims**



1. A reusable insulating jacket for beverage containers, comprising:

a housing having a cylindrical side wall of flexible insulating material formed about an axis and defining a cylindrical cavity therein for receiving a beverage container;

an elongated slit formed in said side wall extending the entire height of said side wall, said slit being defined between edges of said side wall; openable, elongated fastener means attached to said side wall edges for selectively opening and closing said slit to facilitate insertion and removal of a beverage container into and from said cavity; and

a bottom plate of flexible insulating material fixed to a bottom end of said side wall, said bottom plate having a substantially circular portion with a periphery bounded by said side wall and a radial extension projecting from said periphery of said circular portion, said radial extension being fixed to and between said edges of said side wall.

4,478,266

COMPOSITE TREAD HAVING GOOD TRACTION AND REDUCED ROLLING RESISTANCE UPON WEAR

Robert M. Pierson, Hudson; Edward J. Haas, Stow, and Edward C. Montgomery, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 17, 1982, Ser. No. 419,286
Int. Cl.³ B60C *11/00, 1/00*
U.S. Cl. 152—209 R **10 Claims**

1. A tread for a tire, comprising: at least a high hysteresis component having an ASTM D10 54-45 rebound value of from about 30 to about 50 and at least a low hysteresis component having an ASTM D10 54-45 rebound value of from about 50 to about 80, said low hysteresis component being predominant in the radially outermost tread surface, said high hysteresis com-

ponent being predominant in the radially inner portions of said tread, said high hysteresis component having a geometric configuration in said tread so that throughout wear of said tread from the radially outermost portion to the radially innermost portion of said tread, gradually more of said high hysteresis component is exposed throughout said tread.

6. A tire having a tread thereon, the tread comprising:

at least one low rolling resistant material and at least one frictional material, said materials forming separate domains in said tread and being contiguously contacted with

each other such that said low rolling resistant material predominates in the radial outermost tread surface, the amount of said frictional material gradually increasing throughout the radially inward direction of said tread from the radially outermost portion to the radially innermost portion of said tread, whereby gradually more of said frictional material is exposed throughout wear of said tread, and said frictional material having an ASTM D10 54-45 rebound number of from about 50 to about 30, and said low rolling resistant material having an ASTM D10 54-45 rebound number of from about 50 to about 80.

4,478,267

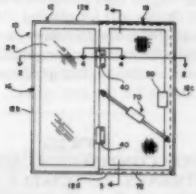
DOOR HINGING ASSEMBLY FOR SLIDING GLASS DOOR STRUCTURE

Raymond E. Smiley, 12 Yeger Rd., Cranbury, N.J. 08512

Filed Sep. 24, 1982, Ser. No. 422,855

Int. Cl.³ E06B 3/32

U.S. Cl. 160—97 **10 Claims**



1. Apparatus for hingedly mounting a screen door to a sliding glass door structure wherein said structure comprises a frame including at least one guide track and first and second glass door panels, said first panel slidable along said one track, said second panel fixed relative to said frame parallel to said track when operative, said apparatus comprising in combination:

means adapted for attachment to said screen door and to said second door panel for permitting said screen door to pivot relative to said second door panel between a first position abutting said frame and a second position removed therefrom; and

means for substantially sealing any gap between said second door panel and said screen door when said screen door is in said first position.

4,478,268

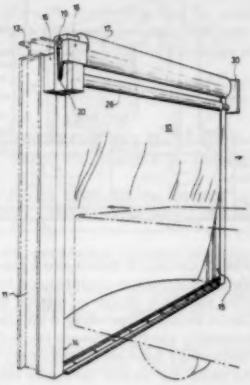
DOOR STRUCTURE

Glenn R. Palmer, Copper Cliff, Canada, assignor to Copper Cliff Door Manufacturing (1980) Limited, Barrie, Canada

Continuation of Ser. No. 220,719, Dec. 29, 1980, abandoned. This application Apr. 1, 1983, Ser. No. 481,277

Int. Cl.³ E06B 9/20

U.S. Cl. 160—310 **14 Claims**



1. A damage-minimizing door comprising:

a flexible curtain having an upper end and a lower end and side edges;

a curtain winding mechanism;

said upper end of said curtain being secured to said winding mechanism for moving said curtain upwards and downwards;

a pair of parallel spaced apart guide channels, said side edges of said curtain being movable in said guide channels, being sealingly engageable therewith under at least atmospheric pressure and being releasable therefrom at a predetermined impact force on said curtain; and,

a rigid bar secured adjacent the lower end of said curtain, said rigid bar being releasably secured to said curtain and releasing therefrom at said predetermined impact force.

4,478,269

FURAN RESIN COATED AGGREGATE

Denis W. Akerberg, Huntley, Ill., assignor to QO Chemicals, Inc., Chicago, Ill.

Filed Feb. 16, 1982, Ser. No. 349,354

Int. Cl.³ B22C 1/22

U.S. Cl. 164—21 **10 Claims**

1. A method for forming a free-flowing, thermosettable composition comprising the steps of:

a. heating a solid particulate material to a temperature of 300° F. or less;

b. admixing phenolic novolak resin with furfural to yield a liquid furfural-phenolic novolak resin blend;

c. mixing the liquid furfural-phenolic novolak resin blend and an amine catalyst onto the heated solid particulate material;

d. allowing the liquid furfural-phenolic novolak resin blend on the solid particulate material to react in the presence of the amine catalyst for 1 to 3 minutes to form a reacted mixture;

e. adding a low-boiling hydrocarbon solvent to the reacted mixture; and,

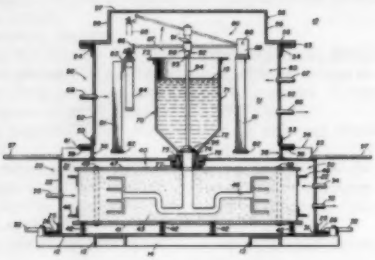
f. continuing mixing until the reacted mixture becomes a theromsettable, free-flowing solid particulate material, said free-flowing solid material being flowable, non-sticky, and thermosettable upon application of heat.

4,478,270

APPARATUS FOR CASTING LOW-DENSITY ALLOYS

Hyman Rosenthal, Fort Lee, N.J., and Harry W. Hammond, Tilton, N.H., assignors to Interlake, Inc., Oak Brook, Ill.

Filed Apr. 1, 1981, Ser. No. 250,010
Int. Cl.³ B22D *18/06*
U.S. Cl. 164—254 2 Claims



1. Apparatus for casting of metals into a gas-permeable mold having an inlet, said apparatus comprising a resevoir vessel for accommodating therein a charge of molten metal and having an outlet, closure means cooperating with said vessel for providing a substantially gas-tight closure thereof, housing means forming a substantially gas-tight chamber for accommodating the associated mold therein and having an inlet opening, coupling means providing communication between said vessel outlet and the mold inlet for passage of molten metal from said vessel into the mold through said inlet opening in said housing means, said coupling means including an outlet nozzle fixedly secured to said resevoir vessel and extending through said inlet opening in said housing means, first collar means disposed in surrounding relationship with said outlet nozzle and coupled thereto, second collar means fixedly secured to said housing means in gas-tight relationship therewith around the entire perimeter of said inlet opening, attachment means fixedly securing said first and second collars together and providing a gas-tight seal therebetween, and a gasket disposed between said first collar means and the mold in surrounding relationship with said outlet nozzle within said chamber for effecting a substantially gas-tight seal between said first collar means and said mold, mounting means disposed in said chamber and cooperating with said housing means resiliently to urge the mold against said gasket for compression thereof to insure formation of a substantially gas-tight coupling between said vessel and the mold inlet, and pressure control means coupled to said vessel and to said chamber to vary the pressures in each for establishing in said vessel a pressure greater than the pressure in said chamber for urging the molten metal through said coupling means and into the mold inlet.

4,478,271

GUIDE APPARATUS FOR A RIGID STARTING BAR

Carlos R. Navarro, and José M. Mallén Fuentes, both of Barcelona, Spain, assignors to Concast Service Union AG, Zürich, Switzerland

Filed Mar. 8, 1982, Ser. No. 355,892
Claims priority, application Switzerland, Mar. 12, 1981, 1689/81
Int. Cl.³ B22D *11/08*
U.S. Cl. 164—426 10 Claims

10. A continuous casting installation comprising:

a continuous casting mold;

means defining an arc-shaped secondary cooling zone operatively associated with said continuous casting mold and through which a correspondingly arc-shaped rigid starting bar having a tail-end and a head can be introduced from the secondary cooling zone with its head leading into the continuous casting mold in a first direction and withdrawn therefrom in a reverse direction;

a withdrawal and straightening unit equipped with at least one drive roll for selectively driving and straightening a cast strand or for driving the starting bar in said first direction as well as in said reverse direction;

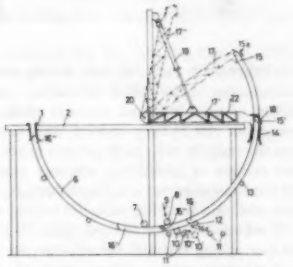
said at least one drive roll of said withdrawal and straightening unit defining a first transport device for the starting bar;

a second transport device serving for moving the starting bar into a rest position after departure from the withdrawal and straightening unit in which said head of the starting bar is located at a predetermined spaced relationship from said first transport device;

said second transport device comprising a holder arm;

said holder arm having opposed ends and being suspended at one of its ends substantially at a center of curvature of said arc-shaped secondary cooling zone;

a force-applying source for pivotably driving said holder arm about said center of curvature;



said holder arm being equipped at its other end with a connection device for the releasable connection of said starting bar predominantly in the region of said tail-end thereof with the holder arm; and

said holder arm being structured to be pivotable selectively into any one of (i) a rest position retaining the tail-end of the starting bar in connection with said connection device and the head of the starting bar in said predetermined spaced relationship from said first transport device, (ii) a substantially horizontal coupling position serving for selectively coupling and decoupling the starting bar predominantly in said region of said tail-end thereof and the connection device and for placing the head of the starting bar on a side of the first transport device which is situated closer to said continuous casting mold, and (iii) an approximately vertical maintenance position providing access to the guide means for the cast strand.

4,478,272

METHOD FOR CONTINUOUS CASTING OF STEEL STRANDS, ESPECIALLY SLABS

Jan Lipton, Wädenswil, Switzerland, assignor to Concast AG, Zürich, Switzerland

Filed Oct. 13, 1981, Ser. No. 310,729
Claims priority, application Switzerland, Oct. 30, 1980, 8071/80
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—454 5 Claims

1. A method of continuously casing strands formed of steel, especially steel slabs, comprising the steps of:

continuously casting molten metal in a continuous casting mold to form a continuously cast strand having a liquid core;

withdrawing the continuously cast strand from the continuous casting mold;

stirring the liquid core of the continuously cast strand at the region of the continuous casting mold by the action of electromagnetic forces; and

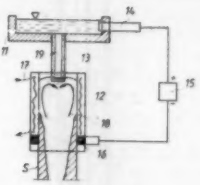
altering the electromagnetic forces in the same sense and in correspondence to the changes in the magnitude of the strand withdrawal speed.

4,478,273

STIRRING METAL IN A CONTINUOUS CASTING MOLD

Bertil Hanas, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 226,547, Jan. 21, 1981, abandoned. This application May 18, 1983, Ser. No. 495,007
Claims priority, application Sweden, Jan. 31, 1980, 8000756
Int. Cl.³ B22D 27/02
U.S. Cl. 164—468 1 Claim



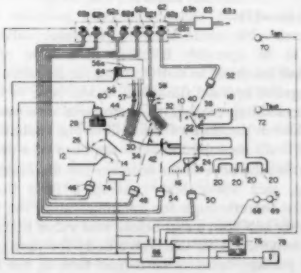
1. A method for stirring molten metal while in a continuous casting mold into the top of which is cast molten metal which continuously travels downwardly while solidifying at the surface of the mold at a location below the mold's top so as to form a strand containing unsolidified metal continuously traveling from the mold's bottom; said method comprising immersing a solid metal electrode directly in the molten metal being cast into the top of said mold and slidingly contacting said strand traveling from the mold's bottom with a second solid metal electrode, and applying DC electric current to said electrodes so as to cause the unsolidified metal in the mold to stir with a vertical flow throughout the height of the mold.

4,478,274

SYSTEM FOR CONTROLLING A VEHICLE-MOUNTED AIR CONDITIONER

Masanori Naganoma, Kariya; Yoshiharu Kato, Toyohashi; Atsunori Saito; Yoshimichi Hara, both of Kariya, and Katsuaki Matsushima, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of

Filed Oct. 16, 1981, Ser. No. 312,323
Claims priority, application Japan, Oct. 17, 1980, 55-145962
Int. Cl.³ F25B 29/00
U.S. Cl. 165—12 23 Claims



1. A system for controlling an air conditioner mounted in an engine-powered roadway vehicle, comprising means for setting a reference temperature, a first digital computer having a memory directly coupled to a storage battery mounted in said vehicle and a processor for generating reference temperature data for said air conditioner in response to said reference temperature and storing the data in said memory during and after the operation of the vehicle engine, one or more sensors for generating auxiliary data representing the operating conditions of said air conditioner, and a second digital computer having a processor powered by said storage battery via an engine operating key switch and coupled to be responsive to said auxiliary data from said sensors and to said stored reference temperature data from said memory for controlling said air conditioner in accordance with said reference temperature data and said auxiliary data immediately following the operation of said key switch.

4,478,275

ABRASION RESISTANT HEAT PIPE

Donald M. Ernst, Leola, Pa., assignor to Thermacore, Inc., Lancaster, Pa.

Filed Jul. 25, 1983, Ser. No. 516,631
Int. Cl.³ F28D 15/00; F28F 19/06
U.S. Cl. 165—133 15 Claims

1. An abrasion and permeation resistant heat pipe comprising:

a casing constructed from material selected to approximate the thermal expansion rate of materials to be coated upon it;

a first layer coated directly onto the casing exterior surface comprising a mixture including aluminum and chromium; and

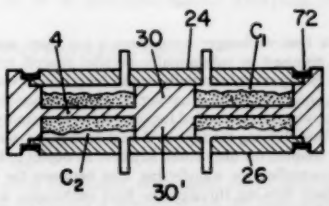
a second layer coated onto the first layer comprising a stabilized oxide selected from the group comprising aluminum, zirconium and yttrium.

4,478,276

HEAT-EXCHANGER PARTICULARLY USEFUL FOR LOW TEMPERATURE APPLICATIONS, AND METHOD AND APPARATUS FOR MAKING SAME

Ralph L. Rosenbaum, 17 Hashalom St., Ra'anana, and Ami S. Breuer, 21 Rambam St., Givatiem, Tel Aviv, both of Israel

Filed Oct. 28, 1981, Ser. No. 316,067
Claims priority, application Israel, Nov. 12, 1980, 61466
Int. Cl.³ F28F 13/18, 21/08
U.S. Cl. 165—164 9 Claims



1. A step-type heat-exchanger particularly useful for low temperature applications, comprising:

a housing including a thermally-conductive member partitioning its interior into a first chamber and a second chamber;

a sintered spongy layer of fine thermally-conductive particles bonded to each of two opposite sides of the thermally-conductive member so as to be exposed along a free face, opposite to its bonded face, for direct contact with a heat-exchange fluid when introduced into each of the two chambers, said housing defining, with the exposed free face of each of said sintered spongy layers, an open flow channel through each of said chambers;

first fluid inlet and outlet means for inletting and outletting a first heat-exchange fluid with respect to said first chamber to flow along said open channel therethru and in direct

contact with said exposed free face of the sintered spongy layer therein; and

second fluid inlet and outlet means for inletting and outletting a second heat-exchange fluid with respect to said second chamber to flow along said open channel therethru and in direct contact with said exposed free face of the sintered spongy layer therein;

said thermally-conductive member being of circular shape, and each of the sintered spongy layers being of substantially annular configuration and including a barrier between the inlet and outlet of the respective chamber to direct the respective heat-exchange fluid from the inlet to pass over the sintered spongy layer to the outlet of the respective chamber;

each of said sintered spongy layers being bonded within a substantially annular recess formed in the respective face of the thermally-conductive member, and having a thickness less than the height of the recess to define said open flow channel for the respective heat-exchange fluid;

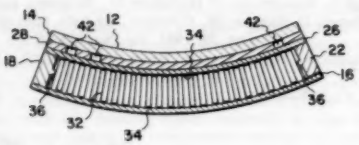
said sintered spongy layers having sufficiently high conductivity and sufficiently large exposed faces in the open channels of the two chambers such that there is no significant temperature gradient between the inlet and outlet means of each of the two chambers.

4,478,277

HEAT EXCHANGER HAVING UNIFORM SURFACE TEMPERATURE AND IMPROVED STRUCTURAL STRENGTH

Irwin R. Friedman, La Crosse; Harry D. Foust, Winona, and Alan G. Butt, La Crosse, all of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Jun. 28, 1982, Ser. No. 392,812
Int. Cl.³ F28F *3/02*
U.S. Cl. 165—185 **11 Claims**



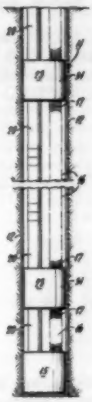
1. A heat exchanger comprising a top plate and a bottom plate disposed in substantially parallel spaced relation, said plates being of substantially equal length and width dimensions; one of said plates having an outer surface the temperature of which is controlled for substantial uniformity thereover by a fluid flowing through said heat exchanger, said one plate being adapted for disposition adjacent an object to be temperature controlled for transferring heat between the object and said fluid flowing through the heat exchanger, a frame disposed between said plates near the peripheries thereof, said frame including frame members affixed to said bottom plate and extending upwardly therefrom to define a chamber; a fin pad disposed within said chamber, said fin pad being a generally corrugated structure closed to fluid flow and having ridges disposed along the major longitudinal fin direction of said fin pad adapted for transferring heat primarily in a first direction in the heat exchanger, said fin pad being in contact with said bottom plate and with a plate disposed above said chamber and supported by said members, said fin pad being supportive of said plates defining said chamber; fluid flow means disposed between said top plate and said fin pad for providing a confined path for fluid to flow through said heat exchanger, said path having a major circuit flow direction transferring heat primarily in a second direction in said heat exchanger, said first and second directions of primary heat transfer being in mutual perpendicular relation; and inlet and outlet openings in said fluid flow means.

4,478,278

SPACER FOR DEEP WELLS

George D. Klein, Thorsby, Canada, assignor to Texaco Canada Resources Ltd., Calgary, Canada

Filed Nov. 27, 1981, Ser. No. 325,534
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—105 **7 Claims**



1. In combination with a deep well having an axis and a casing therein and employing a submersible electrically driven pump having an outlet downhole, tubing connected to said pump outlet for delivering pumped fluid to the surface, and electrical cable for supplying energy to drive said pump, the improvement comprising

spacer means for holding said cable out of contact with said casing and said tubing while said pump is lowered into said well,

said cable having an uneven exterior surface,

said spacer means comprising means for clamping onto said cable to prevent relative movement between said spacer means and said cable,

said clamping means having a complementary uneven interior surface, and

longitudinal passage means through said spacer means for permitting said tubing to pass freely there through.

4,478,279

RETRIEVABLE INSIDE BLOWOUT PREVENTER VALVE APPARATUS

Joseph Puntar, Los Angeles, and B. J. Parham, Ventura, both of Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed Oct. 12, 1982, Ser. No. 433,862
Int. Cl.³ E21B *33/128, 34/06*
U.S. Cl. 166—121 **5 Claims**

1. A retrievable inside blowout preventer valve apparatus adapted to be operably installed in a bore of a tubular receiver sub mounted in a drill string for providing a positive closure against upward fluid flow in the bore of the receiver sub while enabling passage of the normal downward flow of drilling fluid in the bore of the drill string, including:

a valve body movable through the bore of a drill string to and from the bore of the receiver sub mounted in the drill string, said valve body having a fluid flow passage formed therethrough for communicating the bore of the receiver sub above and below said valve body;

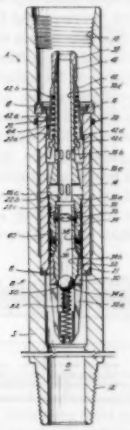
means mounted with said valve body for closing said fluid flow passage upon upward fluid flow in the bore of the drill pipe and for enabling a downard flow through said fluid flow passage and the bore of the drill pipe;

means carried by said valve body for sealing said valve body with the receiver sub for blocking leakage of well fluid therebetween to direct the flow of fluid through the bore of the receiver sub through said fluid passage;

means mounted with said valve body for releasably securing said valve body with the receiver sub to hold said valve body against undesired upward movement during flow control operation of said valve assembly, said means for securing releasable to enable upward retrieving movement of said valve body from the receiver sub through the bore of the drill pipe when desired;

said means for releasably securing including a plurality of securing elements movably disposed in said valve body for radial movement to and from an expanded securing position for engaging a downwardly facing annular shoulder formed in the bore of the receiver sub to block upwardly movement of said valve body from the receiver sub and a contracted released position to enable desired movement of said valve body through the bore of the drill string;

said valve body having a conical locking surface, said



plurality of securing elements operably engaging said conical locking surface for maintaining said plurality of securing elements in the radially expanded securing position, said securing elements capable of being movable radially inwardly to the contracted released position when said conical locking surface moves relative to said securing elements;

each of said securing elements having a first end a second end, each of said securing elements connected at said first end to said slip ring to enable the radial movement of each of said second ends to and from the expanded securing position and the contracted release position; and

spring means mounted with said valve body for urging said slip ring to position said securing elements relative to said conical locking surface to enable radial inward movement of said securing elements to the contracted released position.

4,478,280

STEAM DRIVE OIL RECOVERY METHOD UTILIZING A DOWNHOLE STEAM GENERATOR

Daniel N. Hopkins, Dallas, and Earl S. Snavely, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 488,514, Apr. 25, 1983,. This application Jun. 28, 1983, Ser. No. 508,705

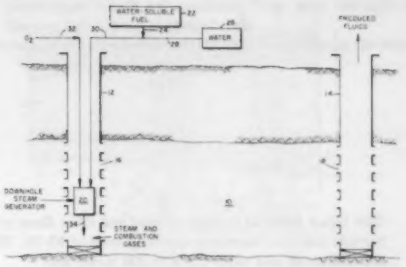
Int. Cl.³ E21B *43/24, 43/243*

U.S. Cl. 166—260 **15 Claims**

1. In a method of recovering viscous oil from a subterranean, permeable, viscous oil-containing formation, said formation being penetrated by at least one injection well and at least one spaced-apart production well, said wells in fluid communication with a substantial portion of the formation, comprising:

(a) injecting a stable hydrocarbon fuel-in-water emulsion under pressure into a downhole steam generator in said injection well;

(b) injecting substantially pure oxygen into said steam generator under pressure via said injection well which contacts the pressurized hydrocarbon fuel-in-water emulsion thereby effecting spontaneous combustion of said hydro-



carbon fuel in the steam generator to generate a mixture of steam and combustion gases that pass through the formation, displacing oil and reducing the oil's viscosity; and

(c) recovering fluids including oil from the formation via the production well.

4,478,281

PROCESS FOR EXTRACTING OIL FROM A SUBTERRANEAN RESERVOIR

Dieter Balzer, and Kurt Kosswig, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Sep. 9, 1981, Ser. No. 300,427

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033926

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—274 **9 Claims**

1. A process for recovering extensively emulsion-free crude oil from a subterranean deposit of medium or high salinity, comprising injecting into an injection well therein, a tenside solution or dispersion in formation water comprising 1–20 wt % of a mixture of 10–90 wt % of ethoxylates of the formula

$$R—(OCH_2CH_2)_nOH$$

and 90–10 wt % of carboxymethylated ethoxylates of the formula:

$$R—(OCH_2CH_2)_n—OCH_2—COOM$$

wherein

R is a hydrocarbon aliphatic group of 4–20 carbon atoms or a mono- or dialkylphenyl group of 1–14 carbon atoms in the alkyl group,

n is 3–30, and

M is an alkali or alkaline earth metal ion or ammonium, wherein the tenside is selected so that the phase inversion temperature of the system:crude oil/formation water/tenside, lies 0°–10° C. above the deposit temperature and recovering said extensively emulsion-free crude oil from said deposit.

4,478,282

HEIGHT CONTROL TECHNIQUE IN HYDRAULIC FRACTURING TREATMENTS

Kenneth G. Nolte, and Michael B. Smith, both of Tulsa, Okla., assignors to The Standard Oil Company, Chicago, Ill.

Filed Apr. 7, 1982, Ser. No. 366,369

Int. Cl.³ E21B *43/267*

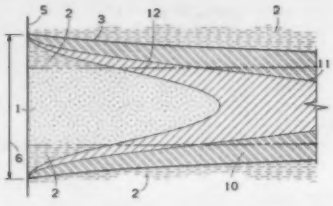
U.S. Cl. 166—281 **3 Claims**

1. A method of hydraulically fracturing an underground formation penetrated by a wellbore, comprising:

(a) injecting a fracturing fluid pad into the formation under

conditions of sufficient rate and pressure to create a fracture in the formation;

(b) injecting into the formation a nonproppant fluid stage comprising a transport fluid and a flow block material, the



flow block material comprises sand and silica flour with a particle size distribution comprising sand of 10–20, 20–40, and 100 mesh and silica flour of 200 mesh; and

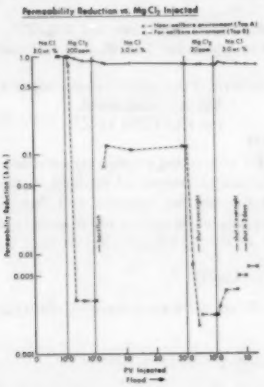
(c) injecting a proppant laden fluid slurry into the formation.

4,478,283

PROCESS FOR IMPROVING WATERFLOOD PERFORMANCE IN HETEROGENEOUS CLAY-SENSITIVE FORMATIONS

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 1, 1983, Ser. No. 510,126
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—292 **12 Claims**



1. A process for reducing the permeability of at least one relatively highly permeable zone in a far wellbore environment of a clay-sensitive subterranean formation penetrated by a wellbore in fluid communication therewith, said formation containing a saline connate water and having said at least one relatively highly permeable zone and at least one relatively less permeable zone, the process comprising the steps of:

(a) injecting a polyvalent cation solution less saline than said connate water via said wellbore into a near wellbore environment of said formation containing a first water-sensitive clay;

(b) contacting said first clay with said polyvalent cation solution in said near wellbore environment of said formation for a time sufficient to transform said polyvalent cation solution into a monovalent cation solution;

(c) displacing said monovalent cation solution from said near wellbore environment into said at least one relatively highly permeable zone of said far wellbore environment; and

(d) contacting a second water-sensitive clay with said monovalent cation solution in said at least one relatively highly permeable zone of said far wellbore environment to reduce the permeability of said at least one relatively highly permeable zone.

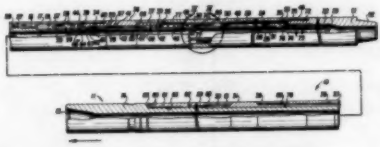
4,478,284

JAR TOOL

Wayne R. Tomm, Calgary, and Curt Ring, Millorville, both of Canada, assignors to Bralorne Resources Limited, Alberta, Canada

Filed Feb. 25, 1982, Ser. No. 352,333
Int. Cl.³ E21B *31/113*
U.S. Cl. 166—297 **2 Claims**

1. A jar tool for use in a drill string, said tool comprising: a mandrell adapted for connection to a first piece of drill pipe at one end of said tool; a housing surrounding a substantial portion of said mandrell and adapted for connection to a second piece of drill pipe at the opposite end of said tool; a first and second pair of abutment faces between said mandrell and housing defining the extended and retracted positions of said jar tool, respectively; an annular chamber between said mandrell and housing adapted to hold hydraulic fluid, said chamber being defined by a first portion having a first area, a second portion having a second area relatively larger than said first area, and a transition zone between said first and second portions; a piston assembly movable within said annular chamber from a first position within said first portion wherein fluid flow from one side of said piston to the other is substantially restricted to a second position within said second portion wherein said fluid flow is substantially unrestricted; a metering passageway in said piston assembly operable to allow passage of hydraulic fluid through said piston assembly; an actuator movable relative to said piston and having a stroke distance defined at one end by the retracted position of said jar tool, at an intermediate distance from said one end by an abutment position against said piston and at the opposite end by the



extended position of said jar tool; spring means within said jar tool having a first end abutting said piston and a second end abutting said jar tool, said spring means being operable to allow piston movement relative to said second end of said spring means from said first position to said second position and to return said piston from said second position to said first position, a first pressure relief valve in said metering passageway and a second pressure relief valve positioned parallel with said first pressure relief valve, said first and second pressure relief valves being operable to define the minimum pressure to allow said piston assembly to move from said first position and to define the maximum pressure within the hydraulic fluid of said jar tool, respectively.

4,478,285

METHOD AND APPARATUS FOR REMOVAL OF DOWNHOLE WELL DEBRIS

Donald B. Caldwell, Norman, Okla., assignor to MAS Mfg. Corp., Norman, Okla.

Filed Jan. 25, 1982, Ser. No. 342,369
Int. Cl.³ E21B *31/08, 37/00*
U.S. Cl. 166—311 **37 Claims**

1. An apparatus for removing downhole well debris, comprising:

an elongate string extendable into a well, said string connectable to a source of reciprocatory and rotary motion;

a debris retaining portion, located in said string, including an outlet and an inlet capable of selective communiation with said well, said inlet including a debris retaining check valve;

a downhole pump portion located in said string in fluid communication with the outlet of said debris retaining portion, said pump portion including a cylinder, a piston

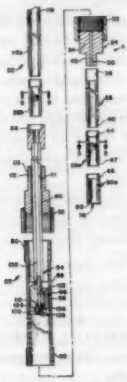
and a piston rod, said piston retained for reciprocation within said cylinder and keyed to said cylinder;

an upper portion of said string in fluid communication with said pump portion and connectable to said source of reciprocatory and rotary motion on one end and to said piston rod on the other end, said piston keyed to said cylinder to communicate the rotary motion of said under portion to said debris retaining portion;

said piston rod and piston head including an internal passageway establishing fluid communication between said upper portion and said debris retaining portion through said pump portion;

a check valve located at the end of said passageway atop said pump portion; and

a check valve arranged to permit flow through said passageway from said pump portion to said upper portion and to prevent flow in the reverse direction.



24. A method for removing solid and liquid downhole well debris including caustic liquid or heavy water comprising the steps of:

lowering a string into a well until the inlet end of such string is in proximity to said debris;

reciprocating a portion of said string to pump said debris into said string;

separating the solid debris from the liquid debris;

collecting said solid debris in a lower chamber;

passing said liquid debris through the interior of a reciprocating piston having a piston head and rod;

collecting said liquid in a chamber connected to the upper end of said piston rod;

removing said debris from said well; and

withdrawing said string from the well and replacing said chamber with a ported sub.

4,478,286

EQUALIZING VALVE FOR SUBTERRANEAN WELLS

Douglas H. Fineberg, Broken Arrow, Okla., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 14, 1983, Ser. No. 466,248
Int. Cl.³ E21B *34/12*
U.S. Cl. 166—324 **14 Claims**

1. A valve positionable within a subterranean well comprising:

a valve housing defining an annular valve seat surrounding a main fluid flow passage;

a shiftable flapper valve head movable to a closed position extending across the main fluid flow passage and sealably engaging the valve seat;

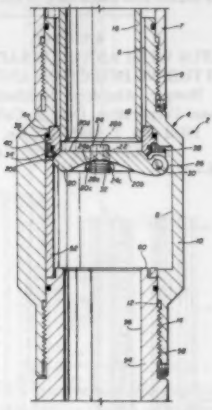
an actuator shiftable mounted within the housing;

means for moving the actuator longitudinally to shift the flapper valve head to open the main fluid flow passage;

an aperture adjacent the periphery of the flapper valve head extending longitudinally through the flapper valve head, the axis of the aperture being parallel to the axis of the flow passage;

equalizing valve means extending through said aperture and longitudinally shiftable from a first position to a second position in which an equalizing flow path through the flapper valve head is opened; and

means on the equalizing valve means for engaging the actuator prior to engagement between said actuator and said flapper valve head, said actuator shifting the equalizing valve to said second position to equalize fluid pressure above and below said flapper valve head, the actuator engaging the flapper valve head upon additional longitudinal movement thereof for opening the main fluid flow passage, when the equalizing valve means is in the open position.

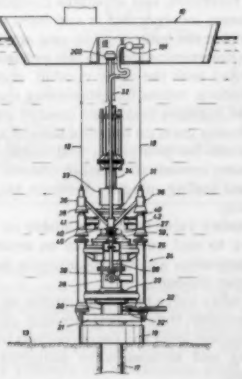


4,478,287

WELL CONTROL METHOD AND APPARATUS

Joseph H. Hynes, Houston, and Hubert L. Elkins, Kingwood, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Jan. 27, 1983, Ser. No. 461,645
Int. Cl.³ E21B *7/12*
U.S. Cl. 166—341 **17 Claims**



1. Well apparatus adapted for use with a floating drilling vessel and for connection to the structural casing string in a well bore established beneath the seabed during installation of conductor casing in the well comprising,

a first wellhead connected to the structural casing string,

a first connector means for connecting a first conduit to the first wellhead,

an annular blowout preventer connected to the first conduit

providing a flow path between the bore of the wellhead and the bore of the annular blowout preventer when the blowout preventer is normally open,

a spool connected to the top of the blowout preventer,

stripper means connected to the top of the spool for stripping conductor casing into the well, and

a marine riser system means connected to the top of the stripper means and extending to the drilling vessel.

4,478,288

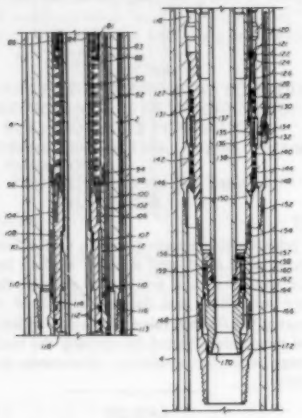
APPARATUS WITH ANNULUS SAFETY VALVE FOR THROUGH TUBING INJECTION AND METHOD OF USE

Michael L. Bowyer, Aberdeen, Scotland, assignor to Baker International Corporation, Orange, Calif.

Filed Oct. 2, 1981, Ser. No. 307,835

Int. Cl.³ E21B *43/00, 34/10*

U.S. Cl. 166—372 **15 Claims**



1. An apparatus for use in injecting material through an inner conduit to the formation in a subterranean well, such as the injection of gas to provide artifical lift to the formation, with fluids being produced through the annulus between the inner conduit and an existing outer conduit, such as a production tubing string, which has an external source of control fluid associated therewith, said apparatus comprising:

nipple means incorporable in said inner conduit and insertable within the outer conduit, said nipple means for establishing communication with said external control fluid line associated with the outer conduit, and extending to the well surface, means for establishing sealing integrity at a position between said inner conduit and said outer conduit, bypass ports on opposite sides of said sealing means, and means for positioning said nipple means relative to said outer conduit to establish control fluid communication and sealing integrity between said inner and outer conduits;

annulus safety valve means mountable on said nipple means relative to said outer conduit to establish control fluid communication and sealing integrity between said inner and outer conduits;

annulus safety valve means mountable on said nipple means and movable from a first position closing the annulus between said inner and outer conduits to a second position opening said annulus when subjected to control fluid pressure;

tubing safety valve means mountable on said nipple means and movable from a first position closing said inner conduit to a second position opening said inner conduit when subjected to control fluid pressure; and

an axially extending control line extending within said annulus between said annulus safety valve means and said tubing safety valve means attachable to said nipple means and communicable through said nipple means with said external control fluid pressure line and communicable with said annulus safety valve and said tubing safety valve.

11. A method of injecting a material, such as gas to provide artificial lift to the formation of a subterranean well, through a production tubing string extending to the formation and having an external control fluid pressure line associated therewith, and producing fluids through the production string while maintaining control over the flow in said production tubing, comprising the steps of:

inserting a workover tubing string through the production string, the workover string having a nipple incorporated therein for establishing communication with the external control fluid pressure line, and axially spaced ports extending therethrough;

sealing the annulus between the workover tubing string and the production tubing string at a position between said axially spaced ports;

positioning an annulus safety valve on the interior of said workover tubing string having an axially extending bypass between said axially spaced ports and a mandrel movable in said bypass to close said bypass, and opening at least one of said ports in response to control fluid pressure;

injecting said material through the workover tubing string to cause produced fluids to flow upward in the annulus between the workover tubing string and the production tubing string; and

increasing the control fluid pressure in said external control pressure line acting on said mandrel to open said ports to permit said produced fluids to flow to the surface of the subterranean well.

4,478,289

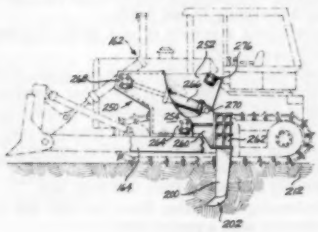
SIDE MOUNTED SOIL RIPPING MECHANISM

Clayton L. Enix, Pearcy, Ark., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 246,550, Mar. 23, 1981, abandoned. This application Dec. 23, 1982, Ser. No. 452,528

Int. Cl.³ A01B *13/08, 63/102*

U.S. Cl. 172—136 **5 Claims**



1. A soil ripper suitable for mounting on a crawler-type tractor which comprises in combination:

a. a generally U-shaped frame means having longitudinal arm portions and a transverse portion, said frame means adapted for being pivotally mounted on the tractor in the position normally occupied by a blade and its supporting blade arms;

b. rigid ripper subframes longitudinally hinged to each arm portion so as to permit limited lateral motion of the subframes, each subframe containing means for holding a ripper teeth and control means for determining the position and attitude of the tooth, so that when in ripping position the teeth will be positioned outside the tracks and between the fore and aft axles of the tractor; and

c. torque resisting rigid strut means associated with the subframes, said strut means adapted to act between the subframes and the tractor frame in order to resist lateral forces experienced by the ripper teeth during operation.

4,478,290
ANTI-BUCKLING DEVICE FOR MINE-ROOF BOLTING MACHINES

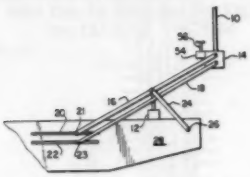
William G. Orthwein, P.O. Box 3332, Carbondale, Ill. 62901

Continuation-in-part of Ser. No. 296,369, Aug. 26, 1981, Pat. No. 4,371,040, which is a division of Ser. No. 020,117, Mar. 13, 1979, Pat. No. 4,328,872. This application Sep. 27, 1982, Ser. No. 424,446

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ B23Q *15/00*; F21C *5/16*

U.S. Cl. 173—11 8 Claims



1. An apparatus for use with an underground mine roof-bolting machine having a torque motor, a pinning rod held for rotation by said torque motor, and controllable means for applying an upward thrust on said torque motor for inserting said pinning rod into a mine roof, said apparatus comprising:

a source for projecting a beam of radiation;

detector means for detecting said beam and producing an output signal in response thereto;

wherein one of said source and said detector means is mounted stationary with respect to said torque motor and the other of said source and detector means is mounted for upward movement with said torque motor; and

thrust control means connected to receive the output of said detector means and connected to said controllable means for controlling the amount of upward thrust exerted by said controllable means in response to the level of said output signal.

4,478,291
DRILLING RIG

Ernest M. Futros, Rosser, Canada, assignor to Canadian Drilling Equipment Ltd., Calgary, Canada

Filed Mar. 1, 1982, Ser. No. 353,064

Claims priority, application Canada, Jan. 8, 1982, 393809

Int. Cl.³ E21C *5/06*

U.S. Cl. 173—147 3 Claims

1. A drilling rig comprising:

a mast,

(b) a top drive adapted to be moved vertically along the mast,

(c) a hydraulic cylinder having one end linked to the bottom of the mast, and having its other end extending toward the top of the mast parallel to the axis of the mast,

(d) a lifting pulley rotatably fixed to the other end of the hydraulic cylinder,

(e) lifting chain means having one end fixed to the top drive passing over the lifting pulley and having its other end linked to the bottom of the mast,

whereby upon extension of the hydraulic cylinder, the lifting pulley rises, causing the chain to lift the top drive, said other end of the chain exerting tension against the bottom of the mast and said one end of the hydraulic cylinder exerting pressure against the bottom of the mast, the lifting force thus being exerted against the bottom of the mast, and

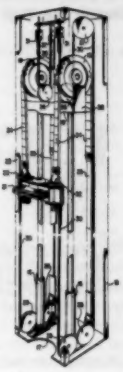
further comprising:

(f) a first pulley rotatably fixed to said other end of the hydraulic cylinder,

(g) a second pulley rotatably fixed to the top of the mast,

(h) a third pulley rotatably fixed to the bottom of the mast,

(i) a cable having one end fixed to the top of the mast, passing under the first pulley, passing over the second pulley, passing under the third pulley, and having its other end fixed to the top drive, whereby upon contraction of the



hydraulic cylinder, the cable is pulled downward by the first pulley, the cable pulling the top drive downward, the hydraulic cylinder further drawing down the lifting pulley, allowing the top drive to draw down the lifting chain means.

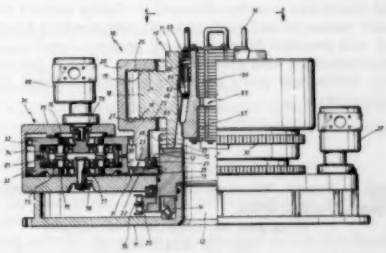
4,478,292
PIPE GRIPPING APPARATUS WITH INTERLOCKING PLATES

Benton F. Baugh, Houston, Tex.; Gerard J-M. Lux, Ifs, and Jean-Paul Ribeyre, Vert Saint Denis, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,421

Int. Cl.³ B23Q *5/027, 5/033*

U.S. Cl. 173—149 12 Claims



1. In a pipe handling apparatus having a body with a central opening arranged to receive a tubular member and including a plurality of toothed circumferentially spaced slip assemblies movable between outer positions disengaged from the tubular member and inner positions engaged therewith, the improvement comprising a plurality of interlocking plate members respectively secured to the slip assemblies and cooperable when said slip assemblies are moved to said inner positions to interlock with adjacent plate members to prevent relative vertical movement between slip assemblies so as to assure uniform engagement of the teeth on said slip assemblies with the tubular member.

4,478,293

HAMMER DRILL OR CHIPPING HAMMER

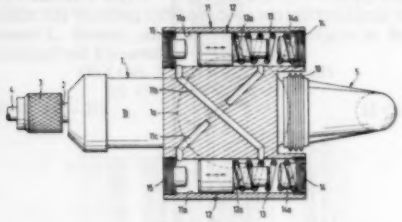
Walter Weilenmann, Schaanwald; Nikolaus Frick, Schaan, both of Liechtenstein, and Peter Hirt, Crans-Pres-Celigny, Switzerland, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 2, 1982, Ser. No. 384,411

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3122979

Int. Cl.³ B25D *17/00*

U.S. Cl. 173—162 R 6 Claims



1. A hammer drill or chipping hammer comprising a housing having a front end and a rear end and an axis extending in the front end-rear end direction, a handle mounted on the rear end of said housing, wherein the improvement comprises means for supporting said handle on the rear end of said housing so that said handle is movably displaceable relative to said housing in the front end-rear end direction, said handle supporting means including first spring, and means for adding weight to said housing and said means for adding weight being movably displaceable in the front end-rear end direction, the weight of said housing is in the range of eight to twelve times that of the weight of said means for adding weight, said means for adding weight comprises a plurality of weighted members and a second spring individually supporting each of said weighted members, said means for adding weight comprises an absorber housing positioned on the outside of said housing and having a front end and a rear end, said absorber housing includes guide cylinders therein extending parallel to the front end-rear end direction of said housing and spaced outwardly from said housing, one said weighted member reciprocates within each of said guide cylinders, each said weighted member being a piston-like member with at least one axially extending part of said piston-like member disposed in sliding contact with the inside surface of said guide cylinder within which it is located, and said absorber housing having pressure equalization lines interconnecting said guide cylinders to equalize pressure created within said guide cylinders as said weighted members reciprocated.

4,478,294

POSITIVE FIRE INDICATOR SYSTEM

Cyril R. Sumner, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 20, 1983, Ser. No. 459,291

Int. Cl.³ E21B *43/116*

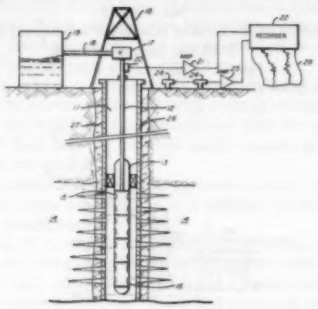
U.S. Cl. 175—4.56 21 Claims

1. A method for positively detecting the firing of all of a string of series sequentially connected well perforating guns in a well borehole, comprising the steps of:

connecting a string of well perforating guns together with a primer cord in series sequential firing order and placing said string of guns in a well borehole located opposite a formation interval to be perforated;

interrupting said primer cord between the ultimate gun in said string and the penultimate gun in said string with a time delay fuse having a predetermined value of time delay;

firing said string of series sequentially connected perforating guns in series relationship by detonating said primer cord from an end thereof opposite from said ultimate gun thereby detonating said perforating guns sequentially along said string from said opposite end gun through said penultimate gun and then detonating said delay fuse and said ultimate gun after a time delay introduced by said time delay fuse;



detecting at the surface of the earth vibratory energy propagated thereto by the detonation of said string of perforating guns and recording representations of said vibratory energy on a record medium as a function of time.

4,478,295

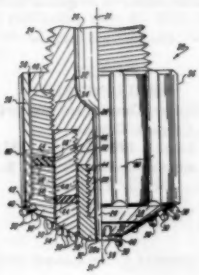
TUNED SUPPORT FOR CUTTING ELEMENTS IN A DRAG BIT

Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631

Continuation-in-part of Ser. No. 214,216, Dec. 8, 1980,. This application Sep. 24, 1982, Ser. No. 422,592

Int. Cl.³ E21B *10/00*

U.S. Cl. 175—56 10 Claims



1. In a rotary drag drill bit having a plurality of cutting elements, the plurality of cutting elements divided into a plurality of separate groups of at least one cutting element in each group, the drill bit having a body portion adapted to be connected to a drill string, at least one sleeve member connected to the body portion and positioned generally coaxially about a rotational axis of said bit, each sleeve member connected at one axial end thereof to the body portion, the sleeve member extending from the one axial end thereof to the other axial end thereof, each sleeve member divided into a plurality of ribbon portions separated by adjacent slots formed through the sleeve member and extending from the other axial end toward the one axial end, the cutting elements of each group connected to a ribbon portion at the other axial end of the sleeve member, and an improvement in combination therewith wherein:

each ribbon portion has resilient and spring-like characteristics to resiliently yield under the influence of shock loads

and to vibrate at a predetermined natural harmonic frequency when excited, and

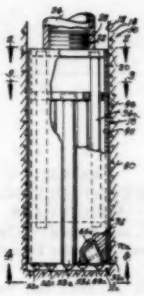
at least one ribbon portion is operatively structured to create a natural harmonic vibrational frequency thereof which is substantially different than the natural harmonic vibrational frequency of any other ribbon portion.

4,478,296

DRILL BIT HAVING MULTIPLE DRILL ROD IMPACT MEMBERS

Charles D. Richman, Jr., P.O. Box 229, Woodstown, N.J. 08098

Filed Dec. 14, 1981, Ser. No. 330,097
Int. Cl.³ E21B *4/06, 6/00*
U.S. Cl. 175—92 **13 Claims**



1. A drill bit for use in drilling a subterranean bore hole in a formation comprising:

housing means defining a longitudinal axis and having a cap plate adapted to be coupled to a drill pipe so as to enable rotation of said housing means about its said longitudinal axis,

said housing means including a base block, and means interconnecting said cap plate and said base block in fixed longitudinally spaced relation,

a movable drill rod holder plate disposed between said cap plate and said base block in generally longitudinal alignment therewith and being movable longitudinally of said housing means,

a plurality of elongated and advanceable drill rod impact members having first ends secured to said holder plate so as to be movable therewith, said drill rod impact members extending generally parallel to said longitudinal axis of said housing means and having cooperative relation with said base block so as to be maintained in said parallel relation during movement of said holder plate, said drill rod impact members having working ends extending outwardly from said base block so as to establish exposed chipping and crushing surfaces when subjected to longitudinal reciprocating movement during rotation of said housing means about its longitudinal axis, said drill rod impact members progressively longitudinally advancing for movement of said drill impact members for the exposure of additional chipping and crushing surfaces below said base block as said working ends under go wear.

4,478,297

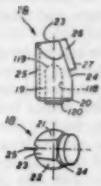
DRILL BIT HAVING CUTTING ELEMENTS WITH HEAT REMOVAL CORES

Robert P. Radtke, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 430,988
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **4 Claims**

3. A drill bit cutting element comprising:

a cylindrical supporting stud of sintered carbide having a cylindrical side wall and an angularly oriented supporting surface with a disc-shaped element bonded thereon comprising a sintered carbide disc having a cutting surface comprising polycrystalline diamond, and heat conducting means supported on said cutting element and operable to conduct heat away from said disc-shaped elements during



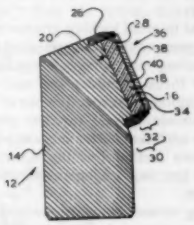
use, said heat conducting means comprising a core of soft heat conductive metal disposed within said stud at a location spaced inwardly from said stud side wall, said core including a projecting portion projecting beyond an end of said stud located opposite said supporting surface and being spaced inwardly from said stud side wall.

4,478,298

DRILL BIT STUD AND METHOD OF MANUFACTURE

Lewis W. Hake; Charles F. Huff, and J. Wayne Miller, all of Midland, Tex., assignors to Petroleum Concepts, Inc., Midland, Tex.

Filed Dec. 13, 1982, Ser. No. 449,137
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **9 Claims**



5. A cutting implement comprising:

a. a cutter disc, which is

(i) circular,

(ii) having a flat back, and including

(iii) a polycrystalline diamond compact which is a polycrystalline diamond wafer on a tungsten carbide substrate,

b. a stud,

c. a flat faced area on the stud, and

d. the flat back of the cutter disc which is bonded to the flat faced area, and

e. a ring around the cutter disc attached to the flat faced area.

4,478,299

ROCK BIT CONSTRUCTION

Dennis D. E. Dorosz, Victoria, Canada, assignor to Trend Rock Bit Alberta, Ltd., Victoria, Canada

Filed Mar. 26, 1982, Ser. No. 362,282
Int. Cl.³ E21B *10/10, 10/22*
U.S. Cl. 175—369 **13 Claims**

1. A rotary earth boring drill bit, comprising:

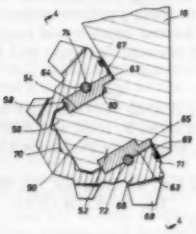
(a) a body structure adapted for threaded connection to a string of drill stem, said body structure defining a plurality of depending cutter supporting legs;

(b) spindle means being formed integrally with each of said depending legs and extending transversely therefrom, said spindle means defining bearing retainer head means at the

free extremity thereof, a reduced diameter cylindrical bearing surface means intermediate the extremity thereof and a circular thrust shoulder at the juncture of said spindle means with said cutter supporting leg;

(c) rotary cutter means defining external cutter teeth and forming an internal spindle and bushing receptacle and further forming internal locking groove means and a lock insertion opening in communication with said internal locking groove means, said rotary cutter means also defining a circular planar surface having a circular seal groove therein, said spindle and bushing receptacle being defined in part by a cylindrical internal surface in intersecting relation with said circular planar surface;

(d) segmented bushing means being positioned about said cylindrical bearing surface means and being received within said spindle and bushing receptacle such that the outer periphery of said segmented bushing means is in mating engagement with said cylindrical internal surface of said rotary cutter means, said segmented bushing means defining annular external locking groove means in registry



with said internal locking groove means within said cutter means, one end of said segmented bushing means forming a projecting rim portion extending axially beyond said circular thrust shoulder and said circular planar surface and engaging the respective one of said cutter support legs and maintaining said circular planar surface in spaced relation with said cutter support leg, said segmented bushing means further forming a circular abutment portion having abutting engagement with said circular thrust shoulder;

(e) locking means being positioned about said segmented bushing means and securing said rotary cutter means in locked assembly with said segmented bushing means, such that said rotary cutter means and segmented bushing means are rotatably mounted on said spindle means; and

(f) a circular seal element extending axially from said circular seal groove and establishing sealing engagement with the respective one of said cutter support legs, compression of said circular seal element being limited by said axially extending projecting rim portion of said segmented bushing means.

4,478,300

DEVICE FOR PREVENTING STICKING OF WEIGHED MATERIAL

Yoshiharu Mikami, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

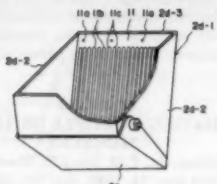
Filed Aug. 26, 1982, Ser. No. 411,622

Claims priority, application Japan, Sep. 9, 1981, 56-134716[U]; Oct. 6, 1981, 56-148938[U]

Int. Cl.³ G01G *13/00, 21/00, 23/00*

U.S. Cl. 177—59 **10 Claims**

1. A device for preventing sticking of comparatively viscous weighed material in an automatic weighing apparatus having one or more material transferring sections including a trough, a hopper and a collecting chute, said device comprising material handling means, interposed between the weighed material and an inner surface of at least a portion of one of said material transferring sections, for reducing the area of contact with the weighed material moving thereover and for providing constrained paths for liquid which separates from said weighed



material and which paths direct the liquid in the direction of weighed material movement.

4,478,301

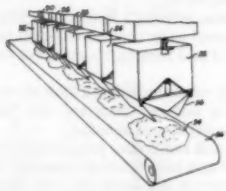
APPARATUS FOR CONTROLLING THE FILLING OF WEIGH PANS

John M. Cochran, Jr., and Ronald N. Cleveland, both of Greenville, S.C., assignors to Frontier Electronics, Inc., Greenville, S.C.

Filed Dec. 15, 1982, Ser. No. 450,105

Int. Cl.³ G01G *19/22, 13/18, 23/02*

U.S. Cl. 177—70 **4 Claims**



1. An apparatus for selecting between mechanical and electrical modes of controlling the flow of fibers being fed by motor driven feed lift apron from a plurality of hoppers to a plurality of weigh pans for producing a predetermined blend of fibers, a balance arm assembly for mechanically setting a predetermined weight of fibers to be fed from a respective hopper to a respective weigh pan and a load cell for electrically monitoring the respective dumps of fibers from said weigh pans onto a conveyor, said apparatus comprising:

means for deactivating said balance arm assembly;

means connected to said load cells for generating an electrical signal corresponding to the actual weight of fibers being fed into said weigh pans;

means for setting a desired weight of fibers for each weigh pan and generating electrical signals representing the desired weight of fibers to be deposited on each cycle into said weigh pans:

a comparator means for comparing said signals corresponding to the actual weight of fibers in a weigh pan with said signal representing said desired weight of fibers for said weigh pan and generating a control signal responsive thereto; and

means for supplying said control signal to said motor driven feed lift apron for filling said weigh pan with fibers until the actual weight of fibers deposited in a respective weigh pan equals the desired weight of fibers for said weigh pan.

4,478,302

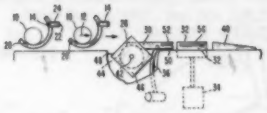
EGG WEIGHING MEANS

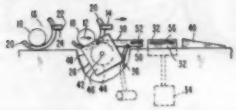
Thomas O. Niederer, and Lee H. Niederer, both of Titusville, N.J., assignors to Otto Niederer Sons, Inc., Pennington, N.J.

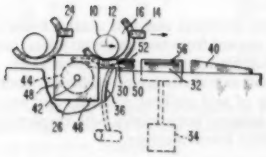
Filed Oct. 20, 1982, Ser. No. 435,427

Int. Cl.³ G01G *19/00*; A01K *43/08*; B65G *47/22*

U.S. Cl. 177—145 **16 Claims**







1. An egg weighing means, particularly usable for high speed weighing of moving eggs, which eggs are being carried by an egg conveying means, said egg weighing means comprising:

(a) an egg lifting means longitudinally oriented along a conveying line of the egg conveying means and positioned to selectively extend upwardly to vertically lift a moving egg out of engagement with respect to the egg conveying means;

(b) a delivery means positioned directly adjacent to said egg lifting means and adapted to receive a moving egg therefrom and support the egg above the egg conveying means;

(c) a weighing platform positioned adjacent to said delivery means to receive moving eggs therefrom for weighing;

(d) a weighing means connected to said weighing platform to sense downward weight exerted on said weighing platform by an egg moving thereon;

(e) an egg urging means located along the path of egg travel adjacent said weighing platform to urge the moving egg to continue to move along said weighing platform in the direction of movement of the egg conveying means without contacting the egg conveying means; and

(f) a removal means positioned adjacent to said egg weighing platform to receive an egg therefrom and return it to the egg conveying means.

4,478,303

WEIGHING SCALE

Robert L. Boyles, 4C Heritage Sound, Milford, Conn. 06460

Filed May 26, 1982, Ser. No. 382,155

Int. Cl.³ G01G *3/14*

U.S. Cl. 177—210 FP **19 Claims**

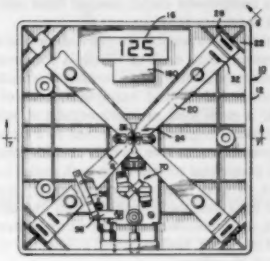
1. A weighing scale apparatus comprising:

a generally horizontal base member,

a generally horizontal platform member over-lying said base member in vertically spaced-apart relationship therewith,

force transmitting means interposed between said base and platform members for transmitting force therebetween in response to a vertically downwardly directed force applied to said platform member,

said force transmitting means including a string system comprising at least two laterally spaced-apart parallel strings stressed substantially uniformly in tension whenever a vertically downwardly directed force is applied to said platform member, the tension force applied to said string



system being related in a known manner to the magnitude of the vertical force applied to said platform member, and

means coupled to said string system for causing said string system to vibrate at its natural frequency and for detecting said natural frequency and producing an output signal related thereto and to the magnitude of the vertical force applied to said platform member.

4,478,304

COMPRESSED AIR POWER ENGINE

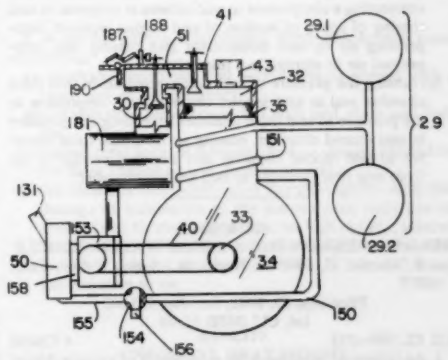
Tony M. Delano, Rte. 4, Box 363, Amarillo, Tex. 79115

PCT No. PCT/US80/01049, § 371 Date Aug. 14, 1980, § 102(e) Date Aug. 14, 1980, PCT Pub. No. WO82/00615, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 14, 1980, Ser. No. 261,122

Int. Cl.³ B60K *9/00*

U.S. Cl. 180—165 **12 Claims**



1. A vehicle comprising a rigid frame firmly attached to and supporting a passenger compartment drive wheels attached to said frame, an air tank assembly and an engine supported on said frame,

said tank assembly comprising a high pressure main tank sub-assembly and a recovery tank sub-assembly, said tank assembly and engine forming an engine system,

said engine comprising a rigid casing, a crankshaft and a camshaft in engine casing bearings therefor on said casing, said casing having formed therein a plurality of like cylindrical chambers, a piston movable in each of said cylindrical chambers which piston forms a smooth slidable fit with a wall of each such chambers, each piston rotatably attached to the crankshaft by a linkage, said camshaft actuating a valve timing mechanism, each cylinder having

an exhaust valve, a first engine exhaust conduit extending from said exhaust valve to the inlet of a turbine and a second conduit extending from openings near the lower portion of the wall of each cylinder to the inlet of the turbine,

said turbine operatively connected to an air compressor through a first air compressor clutch, a compressor intake conduit providing a feed conduit for air into said compressor and a compressor outlet conduit from said compressor to a first recovery tank,

said main tank sub-assembly comprising a plurality of main high-pressure tanks each of which is connected to a main tank conduit, said main tank conduit connected to a main tank control valve, said main tank control valve connected to a main tank pressure regulator, said main tank outlet pressure regulator connected to a pressure control tank, a pressure sensitive switch in said pressure control tank and connected to said main tank outlet control valve, on outlet of said pressure control tank connected to a manifold inlet line, said manifold inlet line connected to a manifold, an accelerator control valve connected to said manifold inlet line, said manifold connected to said engine cylindrical chambers,

an outlet valve connected to said first recovery tank, a recovery tank outlet conduit operatively connected to said recovery tank outlet valve, a pressure sensor with an input connected to the interior of said recovery tank, an output of said pressure sensor connected to said main control valve and to said outlet valve of said recovery tank, said outlet conduit of said recovery tank connected to said pressure control tank.

9. Process of driving a vehicle by the steps of

(a) passing high pressure air from a first chamber at high pressure past a regulator valve to a second chamber at a lower pressure and passing air from said second chamber to a movable engine element in an engine casing therefor in an engine and driving said engine element therewith and driving ground engaging wheels of said vehicle by said engine, and concurrently

(b) passing exhaust air from said engine casing to a turbine, sensing the speed of motion of said engine element and connecting a compressor to said turbine in response to said sensing of speed of motion of said engine element, compressing air by said compressor and passing said compressed air to storage in a third chamber,

(c) sensing the pressure of said compressed air in said third chamber and in said second chamber and, responsive to the pressure in said third chamber exceeding the pressure in said second chamber, passing air from said third chamber to said second chamber and stopping passage of air from said first chamber to said second chamber.

4,478,305

REAR SUSPENSION FOR A THREE WHEEL VEHICLE

Lee R. Martin, II, 3945 N. Bonita St., Spring Valley, Calif. 92077

Filed Sep. 27, 1982, Ser. No. 423,643
Int. Cl.³ B62D *61/06*
U.S. Cl. 180—215 **6 Claims**

1. An improved suspension for rear wheels of a motor driven vehicle having a single steerable front wheel and two driven rear wheels, said front wheel being carried by a central longitudinally extending frame member comprising:

a central driven shaft rotatably connected to said central frame member;

a first and second axle shaft the distal ends of each shaft being directly connected to one of said two driven rear wheels;

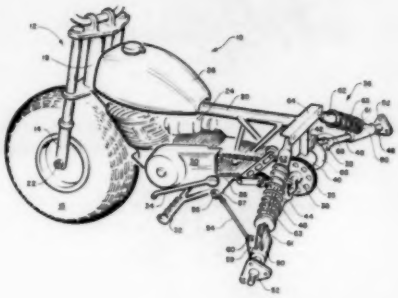
a first and second universal joint each one of which is connected between the end opposite said distal end of one of said first and second axle shafts and opposite ends of said central driven shaft;

first and second collar members each surrounding one of said axle shafts for relative rotation therewith and positioned inwardly from their associated driven rear wheel toward said central longitudinal frame member;

first and second control arms pivotally connected between their respective collar member and said central longitudinal frame member forward of said central driven shaft;

first and second resilient members having the function of vertical control rods are connected between their respective collar members and said central frame member at a location inward from said universal joints thereby forming an acute angle relative to said driven axles;

whereby said axle shafts are pivotable vertically against the resilience of said resilient members and are substantially fixed in position horizontally with respect to said central longitudinal frame member.

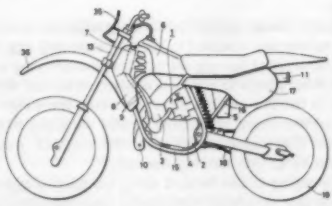


4,478,306

RADIATOR MOUNTING MECHANISM

Tomoyuki Tagami, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,203
Claims priority, application Japan, Jul. 3, 1981, 56-103262
Int. Cl.³ B60K *11/04*
U.S. Cl. 180—229 **5 Claims**



1. A radiator mounting mechanism for a motorcycle, said motorcycle having a frame, a water-cooled engine, and a radiator connected to said engine through a tube to cool said engine, said radiator having a plurality of positions relative to said frame, said mounting mechanism comprising adjusting means for selectively placing said radiator in said plurality of positions relative to said frame; wherein said adjusting means comprises a guide means for guiding the movement of said radiator to any one of said plurality of positions, and a fixing means to fix the position of said radiator at any one of said plurality of positions; and wherein said frame includes an obliquely extending head pipe, a main pipe extending along travel direction of said motorcycle and having a front end integrally fixed to said head pipe, a down tube having an upper end integrally fixed to said head pipe, and a pipe extending between said main pipe and said down tube, and wherein said guide means comprises an upper linear member fixed to and extending between said main pipe and said down tube, and a

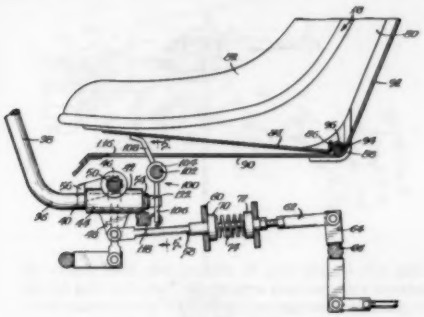
lower linear member fixed to and extending between said pipe and said down tube.

4,478,307

CONTROL HANDLE LOCKUP

Ronald C. Natzke, and Maurice Klee, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 5, 1981, Ser. No. 308,371
Int. Cl.³ B60K *26/00*; G05G *5/06, 11/00*
U.S. Cl. 180—273 **14 Claims**



1. A control lever and lockup arrangement for a vehicle having a vehicle body, and seat means positioned on said body for receiving an operator, comprising:

control lever means mounted on said body for a bi-axial movement about first and second generally perpendicular axes, said lever means being movable about said first axis from a neutral position to an operative position, and movable about said second axis from said neutral position to another operative position; and

lever lockup means operatively associated with said seat means movably mounted on said vehicle body for movement from a first position to a second position attendant to the operator being seated in said seat means, said lockup means being operatively associated with said control lever means whereby in said second position of said lockup means said lever means is retained from moving from said neutral position into either of said operative positions.

4,478,308

INDUSTRIAL VEHICLE HAVING AN ADJUSTABLE AND PIVOTAL ARMREST

Lambertus G. M. Klaassen, Oud Beijerland, Netherlands, assignor to De Rotterdamsche Droogdok MIJ B.V., Schiedam, Netherlands

Filed Feb. 9, 1983, Ser. No. 465,332
Claims priority, application Netherlands, Feb. 17, 1982, 8200614
Int. Cl.³ B60N *1/06*
U.S. Cl. 180—326 **10 Claims**

1. An industrial vehicle comprising a frame, a driver seat supported by said frame and provided with at least one armrest mounted on an upwardly-extending supporting column together with control means for controlling the vehicle, said column being mounted on a generally upright support member for adjustment lengthwise of said support member, first locking means for locking said column in a desired height position with respect to said support member, means mounting said support member for pivoting about a pivot axis located near the lower end of said support member and extending crosswise of the seat whereby by pivoting said support member the armrest can be moved out of an operative position towards the rear side of the driver seat into an inoperative position and vice versa, second locking means for selectively locking said support member in either the operative or inoperative position of the armrest, and means for operating said second locking

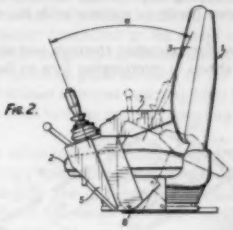


Fig. 2.

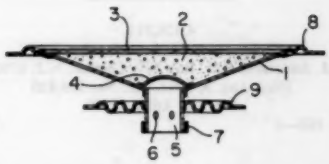
means including a handle mounted near the top end of the column.

4,478,309

SPEAKER EQUIPPED WITH DIAPHRAGM FILLED WITH FOAMED RESIN

Shinichiro Kawamura, and Takahiko Irimajiri, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 388,242
Claims priority, application Japan, Jun. 19, 1981, 56-93880
Int. Cl.³ G10K *13/00*
U.S. Cl. 181—167 **19 Claims**



1. A speaker having a diaphragm filled with foamed resin, comprising:

a cylindrical type voice coil bobbin wound around with a voice coil on the periphery;

said diaphragm, being connected with said voice coil bobbin;

a foamed resin body of substantially low density located on the front surface of said diaphragm; and

a thin sheet, of sufficiently high flexural rigidity such that damage or indentation of the foamed resin body can be avoided and the diaphragm achieves high rigidity, secured to the surface of said foamed resin body, said thin sheet having a flexural rigidity of 0.002–0.2 N·m and being impermeable to air.

4,478,310

UNIVERSAL HEAT SHIELD

Donald P. Harter, Ottawa Lake, Mich., assignor to APX Group, Inc., Toledo, Ohio

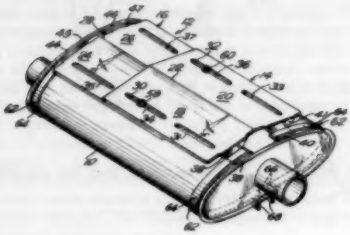
Filed Mar. 25, 1983, Ser. No. 478,849
Int. Cl.³ F01N *7/18*
U.S. Cl. 181—241 **8 Claims**

1. An adjustable heat shield for an exhaust system part, said shield being adjustable for attachment to exhaust system parts of different lengths and contours, said shield comprising:

a plurality of elongated sheets of metal each of which includes a plurality of angularly aligned planar members, with each pair of adjacent planar members intersecting along a crease line which extends generally parallel to the longitudinal axis of said sheet, the angular alignment of said planar members about the respective crease lines being adjustable, at least one of said planar members of each said sheet including one

or more slots aligned parallel to said crease line, with the slots in each sheet being spaced equidistant from the respective crease line such that when said sheets are placed in face to face overlapping relationship, the slots of one said sheet will be at least partly in register with the slots of adjacent sheets;

fastening means for extending through said slots to adjustably secure said sheets in overlapping face to face relationship;



means for supporting said sheet in spaced relationship with respect to said exhaust system part; and

means for removably mounting said shield on said exhaust system part, whereby said sheets may be slidably moved with respect to one another parallel to said crease lines to adjust the length of said shield, and whereby the angular alignment between the planar members of each said sheet can be adjusted to change the contour of said shield.

4,478,311

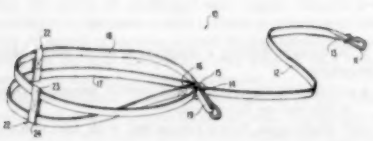
SAFETY HARNESS FOR HUNTERS

Jeffrey J. Anderson, P.O. Box 527, Chester, N.J. 07930

Filed Aug. 3, 1981, Ser. No. 289,820

Int. Cl.³ A62B *35/00*

U.S. Cl. 182—3 **7 Claims**



1. A harness for selective use as a seat or safety belt by a hunter perched in an elevated position or for dragging a load on the ground while walking, comprising:

(a) a single length of flexible webbing provided at one end with means for detachably connecting in an adjustable manner a first portion of said webbing selectively around a fixed support or around a load to be dragged, said fixed support or said load can be of differing girth;

(b) the length of said webbing being sufficient to permit a second portion of the webbing to completely encircle a portion of a hunter's body twice and to allow a remaining portion of the webbing to position said connecting means spaced from the hunter's body; and

(c) snubbing means comprising two relatively movable elements for coacting in frictional locking engagement with said webbing and with each other to adjust the length of the body encircling portion; one of the two elements of said snubbing means comprising a member having an opening defined by opposing margins disposed parallel to each other in a direction transverse to said webbing and of sufficient size to permit a doubled over portion of said webbing to be inserted through said opening from one side of the opening to define a loop projecting from the other side of the opening, the other said two elements being ring-shaped and including an elongated member inserted transversely through said projecting loop and having a width sufficient to prevent said last mentioned member being pulled through said opening.

4,478,312

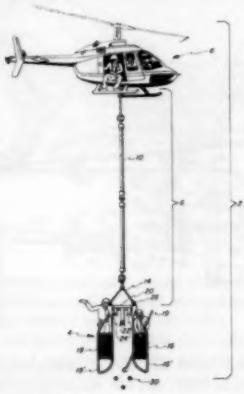
SYSTEM AND PORTABLE CAGE FOR SERVICING POWER TRANSMISSION LINES

Michael P. Kurtgis, 4651 Sheridan St., Hollywood, Fla. 33021

Filed Sep. 30, 1982, Ser. No. 428,595

Int. Cl.³ E04G *3/10*

U.S. Cl. 182—142 **3 Claims**



1. A skip adapted to be lifted by a lifting means onto a plurality of suspended wires, said skid being adapted to be supported by said plurality of said suspended wires, said skid comprising:

one or more basket means for holding and supporting men or material, a cross frame rigidly and supportingly attached to each of said one or more basket means, said cross frame comprising a plurality of skids, each skid of said plurality of said skids being adapted to locate over and partially around one wire each of said plurality of wires if said skid were lowered onto said plurality of wires, a harness means for lifting said skid, said harness means being attached to said cross frame, said harness means being adapted to be attached to said lifting means, whereby said lifting means is effective to lift said skid by said harness means above said plurality of suspended wires and lower said skid onto said plurality of suspended wires, each said skid located over and partially around one wire of said plurality of suspended wires so as to support said skid, and whereby said skid hangs from said wires, and wherein various wires of said plurality of suspended wires lie in a plurality of horizontal planes, and various of said skids are located in different horizontal planes, said different horizontal planes selected so that said skids are effective to mount said skip to said plurality of suspended wires.

4,478,313

SPRING POWERED PRIME MOVER

Hiroshi Wakase, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,566

Claims priority, application Japan, Dec. 27, 1979, 54-182943[U]

Int. Cl.³ F03G *1/00*; A63H *29/04, 31/00*

U.S. Cl. 185—39 **8 Claims**

1. A spring wound prime mover capable of use in toys and the like comprising:

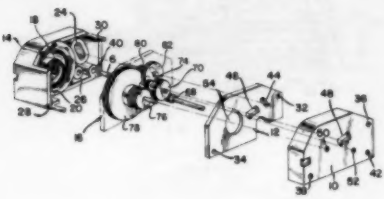
a housing member including a first and second shell member, an intermediate plate member that divides the shell mem-

bers, and a pair of mounting posts that extend from one shell member to the other, one of the shell members has a circuitous cavity with a plurality of recessed positions, the housing shell members are formed from plastic and are held together through the interaction of solely the shell members and the intermediate plate;

an output shaft rotatably mounted to the housing member;

a spring member capable of selectively storing and releasing energy to drive the output shaft mounted in the circuitous cavity and being removably anchored to a recessed portion;

a gear train assembly connected to the spring member and



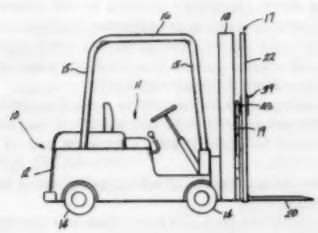
the output shaft and capable of providing a first and a second gear ratio including a first gear movably mounted to be automatically forced into engagement when driven by an external force to provide a first gear ratio for moving the spring member for storing energy and to be automatically forced out of engagement when the spring member drives the output shaft and a second gear movably mounted to be automatically forced into engagement when the spring member drives the output shaft to provide a second gear ratio and to be automatically forced out of engagement when the gear train assembly is driven by an external force for moving the spring member to store energy.

4,478,314

SAFETY SHIELD

Earl C. Dorman, Sulphur, La., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 30, 1982, Ser. No. 412,472
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 R **12 Claims**



1. A material handling vehicle to protect the operator from the potentially explosive or flammable materials being handled, comprising:

(a) a mobile frame having a plurality of wheels at least some of which are steerable;

(b) an operator compartment mounted on the mobile frame from which the operator controls the vehicle;

(c) lifting means at least partially movably mounted to the frame, at least a portion of the lifting means engaging the materials being handled;

(d) at least partially transparent shield means having opposing first and second surfaces for protecting the operator, the shield means being detachably mounted to and movable with the lifting means interpositioned between the operator compartment and the portion of the lifting means engaging the materials being handled;

(e) coupling means connected to the shield means for coupling the shield means to the lifting means and having at least a first fastening plate fastened to the opposing first surface and at least a second fastening plate fastened to the opposing second surface; and said coupling means further having

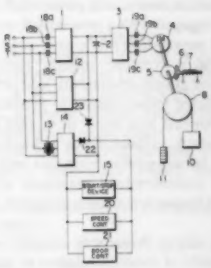
(f) a plurality of generally parallel, spaced apart retaining brackets fixedly fastened to the at least first fastening plate and extending to the at least second fastening plate to provide support for means to attach the shield means to the lifting means.

4,478,315

APPARATUS FOR OPERATING AN AC POWER ELEVATOR

Masami Nomura, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1982, Ser. No. 440,350
Claims priority, application Japan, Nov. 16, 1981, 56-183208
Int. Cl.³ B66B 5/02
U.S. Cl. 187—29 R **12 Claims**



1. An apparatus for operating an AC powered elevator, comprising:

a rectifier the input of which is connectable to an external AC power source for rectifying the output of the AC power source into a DC voltage;

a capacitor connected to the output side of said rectifier for smoothing the output of said rectifier;

an inverter connected to said capacitor for converting the DC output smoothed by said capacitor into AC power having a variable frequency;

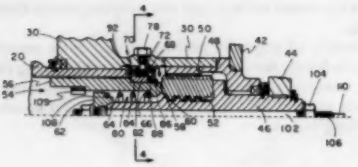
an AC motor driven by the AC power output of said inverter for actuating the cage of the elevator;

an elevator control means having a start and stop device which is connectable to the external AC power source for controlling the starting and the stopping of the cage of the elevator and a speed controller for producing a speed command signal for controlling the enablement and the disablement of said inverter;

a power interruption detecting circuit for detecting the interruption of the external AC power source; and

an emergency operating circuit connected to said capacitor and said elevator control means by the operation of said power interruption detecting circuit for driving said elevator control means by the electric power of said capacitor.

4,478,316
SLACK ADJUSTER FOR A DISC BRAKE
Donald J. Davidson, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Apr. 11, 1983, Ser. No. 484,025
Int. Cl.³ F16D 65/56
U.S. Cl. 188—71.9 4 Claims



1. A slack adjuster for a disc brake of the type which includes a disc mounted for rotation about an axle, a brake housing mounted on said axle in alignment with a friction surface of said disc, a non-rotatable braking piston mounted in said housing for axial movement toward and away from said friction surface of said disc, brake actuation means mounted on said housing, a powershaft mounted within said housing co-axially aligned with said piston and capable of selective rotation by said brake actuation means, said powershaft having worm gear teeth thereon engaged with a powershaft nut within said housing which said powershaft nut is prevented from rotating and capable of axial movement directly corresponding to said selective rotation of said powershaft, said powershaft nut being operably connected to said piston to produce said axial movement thereof toward and away from said friction surface of said disc, said slack adjuster being utilized to maintain a running clearance between said piston and said friction surface of said disc at a predetermined maximum distance when said brake actuation means is not being actuated, said slack adjuster comprising:

an adjusting sleeve threadably coupled to said piston and being capable of rotation relative to said piston to adjust the axial position of said piston relative thereto, said adjusting sleeve being rotated in a first direction causing said piston to be adjusted toward said disc;

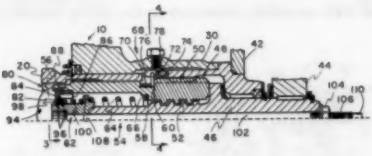
means for biasing said adjusting sleeve away from said disc to cause a rearward end thereof remote from said disc to be maintained in contact with a forward end of said powershaft nut to produce said axial movement thereof corresponding with said axial movement of said powershaft nut;

a clearance sensing ring mounted about said adjusting sleeve for said axial movement therewith;

camming means between said clearance sensing ring and said housing, said camming means causing said clearance sensing ring to rotate in said first direction when said axial movement of said adjusting sleeve toward said disc exceeds said predetermined maximum distance and in a second direction opposite from said first direction when said axial movement of said adjusting sleeve away from said disc exceeds said predetermined maximum distance; and

clutch means between said clearance sensing ring and said adjusting sleeve producing corresponding rotation of said adjusting sleeve in said first direction until said piston contacts said friction surface of said disc to provide a braking force thereto and preventing corresponding rotation of said adjusting sleeve in said second direction.

4,478,317
SLACK ADJUSTER FOR A DISC BRAKE
David D. Sheill, Farmington Hills, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Apr. 11, 1983, Ser. No. 484,026
Int. Cl.³ F16D 65/56
U.S. Cl. 188—71.9 7 Claims



1. A slack adjuster for a disc brake of the type which includes a disc mounted for rotation about an axle, a brake housing mounted on said axle in alignment with a friction surface of said disc, a non-rotatable braking piston mounted in said housing for axial movement toward and away from said friction surface of said disc, brake actuation means mounted on said housing, a powershaft mounted within said housing co-axially aligned with said piston and capable of selective rotation by said brake actuation means, said powershaft having worm gear teeth thereon engaged with a powershaft nut within said housing which said powershaft nut is prevented from rotating and capable of axial movement directly corresponding to said selective rotation of said powershaft, said powershaft nut being operably connected to said piston to produce said axial movement thereof toward and away from said friction surface of said disc, said powershaft being rotated in a first direction during actuation of said brake actuation means to move said piston toward said disc and in a second direction to move said piston away from said disc, and said slack adjuster being utilized to maintain a running clearance between said piston and said friction surface of said disc at a predetermined maximum distance when said brake actuation means is not being actuated, said slack adjuster comprising:

an adjusting sleeve threadably coupled to said piston and capable of rotation relative to said piston to adjust an axial position of said piston relative thereto, said adjusting sleeve being rotated in said first direction causing said piston to be adJusted toward said disc;

means for biasing said adjusting sleeve away from said disc to cause a rearward end thereof remote from said disc to be maintained in contact with a forward end of said powershaft nut;

means for preventing rotation of said adjusting sleeve in said second direction;

lost motion means between said powershaft and said adjusting sleeve, said lost motion means allowing rotation of said powershaft without corresponding rotation of said adjusting sleeve when said piston moves toward said disc less than said predetermined maximum distance and with corresponding rotation of said adjusting sleeve when said piston moves toward said disc in excess of said predetermined maximum distance; and

force limiting clutch means associated with said lost motion means preventing said corresponding rotation of said adjusting sleeve when said piston contacts said friction surface of said disc to provide a braking force thereto and when said powershaft rotates in said second direction.

4,478,318

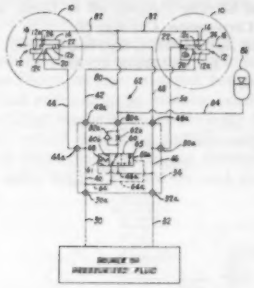
VEHICLE BRAKE SYSTEM

Ronald D. Hayden, Eastlake, Ohio, assignor to Euclid, Inc., Cleveland, Ohio

Filed May 14, 1982, Ser. No. 378,131

Int. Cl.³ F16D *55/18;* **B60T** *11/10, 15/46;* **F15B** *13/042*

U.S. Cl. 188—72.4 **9 Claims**



1. For a brake system having brake assemblies actuated by a piston that includes first and second brake applying effective pressure areas and a brake release effective pressure area, an improved brake control system, comprising:

(a) a source of pressurized fluid;

(b) first and second conduit means in fluid communication with said first and second brake applying effective pressure areas;

(c) a third conduit means in fluid communication with said brake release effective pressure area;

(d) control valve means including a valve body and a condition responsive valve element movably disposed within said valve body for movement between two positions, operative to control the communication of pressurized fluid to said third supply conduit; and,

(e) said valve body further defining a passage means for communicating said first conduit means with said third conduit means in response to one sensed condition, and operative to communicate said third conduit means with a discharge means defined by said valve body in response to a second sensed condition.

4,478,319

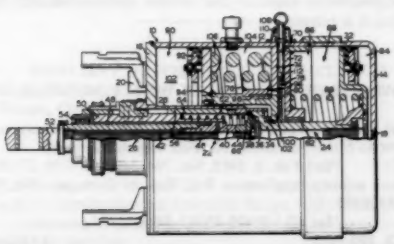
SPRING-APPLIED BRAKE UNIT FOR RAILWAY VEHICLE WITH MANUAL RELEASE ARRANGEMENT

Enrico Casalone, and Dario Barberis, both of Turin, Italy, assignors to WABCO Westinghouse Compagnia Freni S.p.A., Turin, Italy

Filed Jan. 28, 1983, Ser. No. 461,777

Int. Cl.³ F16J *1/10*

U.S. Cl. 188—170 **10 Claims**



1. A brake actuator for railway vehicles comprising:

(a) a first cylinder;

(b) a primary piston operably disposed in said first cylinder and subject to fluid pressure supplied thereto to effect operation of said primary piston in a brake application direction;

(c) a second cylinder;

(d) a secondary piston operably disposed in said second cylinder;

(e) an actuator spring acting on said secondary piston to effect operation thereof in a brake application direction;

(f) actuator rod means operable in response to said operation of either said primary and said secondary pistons in said brake application direction to produce braking on the vehicle, said actuator rod means comprising an actuator rod and means for adjusting the length of said actuator rod, said adjusting means including:

(i) a screw-threaded, non-rotatable nut member having an externally projecting portion on which brake means may be mounted; and

(ii) a screw-threaded spindle threadedly engageable with said nut member; and

(g) means for normally locking said spindle against rotation to provide joint axial displacement of said spindle and said nut member in said brake application direction in response to said operation of either said primary piston and said secondary piston, said locking means being manually releasable to permit rotation of said spindle under the axial force of said actuator spring acting through said secondary piston during operation thereof, whereby said rotation of said spindle is in such sense as to decrease the length of said actuator rod.

4,478,320

OVERLOAD-RESPONSIVE CLUTCH APPARATUS FOR SELECTIVE CONNECTION OF TWO DRIVE SHAFTS TO A SINGLE DRIVEN SHAFT

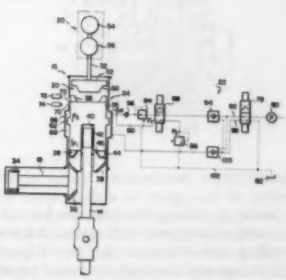
Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,797

Claims priority, application Japan, Oct. 12, 1981, 56-150018[U]

Int. Cl.³ F16D *7/00, 21/02*

U.S. Cl. 192—48.91 **4 Claims**



1. Overload-responsive clutch apparatus comprising:

(a) a driven shaft;

(b) a first rotor rotatably mounted on the driven shaft and locked against axial displacement relative to same;

(c) a first drive shaft coupled to the first rotor in driving relationship;

(d) a piston mounted on the driven shaft for joint rotation therewith and for sliding movement in the axial direction thereof, the piston having one end held opposite to the first rotor;

(e) a first clutch for connecting and disconnecting the first rotor and the piston, the first clutch being adapted to

disengage automatically when the torque being transmitted from the first rotor to the piston exceeds a predetermined limit;

(f) a second rotor disposed opposite to another end of the piston in coaxial relationship;

(g) a second drive shaft coupled to the second rotor in driving relationship;

(h) a second clutch for connecting the second rotor to the piston when the latter is declutched from the first rotor;

(i) means defining first and second opposed fluid chambers for urging the piston in opposite axial directions relative to the driven shaft; and

(j) a fluid control ciruit for normally holding the first fluid chamber supplied with a fluid under pressure in order to hold the piston connected to the first rotor via the first clutch and for allowing the piston to be displaced away and declutched from the first rotor when the torque being transmitted from the first rotor to the piston exceeds the predetermined limit, the fluid control circuit being further adapted to deliver the pressurized fluid into the second fluid chamber in order to move the piston into engagement with the second rotor via the second clutch.

4,478,321

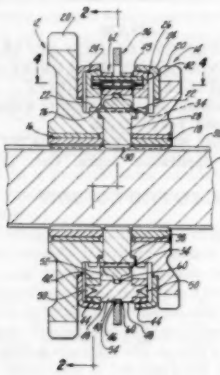
SYNCHRONIZER MECHANISM

Philip N. De Franco, and Henry F. Jones, Jr., both of Schenectady, N.Y., assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jan. 20, 1982, Ser. No. 341,034

Int. Cl.³ F16D *23/06*

U.S. Cl. 192—53 E **6 Claims**



1. A synchronizer mechanism capable of selectively connecting either of two gears to a shaft upon which they are rotatably mounted, the synchronizer mechanism comprising a sliding sleeve interconnected with said shaft for rotation therewith, the sliding sleeve having a plurality of apertures, a pair of synchronizer rings which are rigidly joined together by at least two blocker pins extending through certain of said apertures, and at least two spring assemblies extending through other of said apertures, said synchronizer mechanism being characterized by each of said spring assemblies comprising a generally rectangular spring housing disposed between said pair of synchronizer rings, an elongated base plate, and spring means disposed between the base plate and a portion of the spring housing, said pair of synchronizer rings being provided with opposed recesses which unrotatably receive opposed ends of the base plate, said spring means including a pair of elongated opposed leaf springs, the ends of which are in contact with each other, and a midportion of each of the leaf springs being in contact with an intermediate surface of either the base plate or the spring housing, and in which each of said spring housings has a base portion and opposed sides extending away from the base portion at generally right angles, the associated base plate and spring means being disposed between said opposed sides.

4,478,322

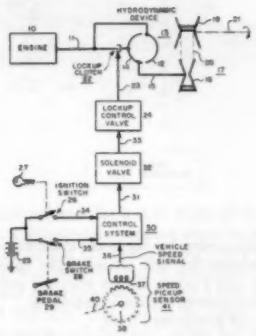
LOCKUP CLUTCH CONTROL SYSTEM

David K. Carlson, Dearborn; William G. Burnia, and William J. Haley, both of Sterling Heights, all of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 24, 1981, Ser. No. 257,292

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.055 **13 Claims**



1. An electronic control system for regulating engagement and release of a lockup clutch for a hydrodynamic device connected in a vehicle drive drain of a vehicle which includes a brake pedal, which control system comprises:

pickup means for providing an input signal varying as a function of vehicle speed;

first means for establishing a first threshold signal level, which first means is adjustable to regulate the vehicle speed at which the clutch is locked up;

comparison means, connected to receive the input and first threshold signals, operable when the input signal exceeds the first threshold signal to provide an output signal;

actuating means, coupled between the comparison means and the lockup clutch, for engaging the lockup clutch when the output signal is present;

an override circuit, connected to effect clutch release when the vehicle brake pedal is depressed, without waiting for the vehicle speed to decrease to the threshold signal level set by the first means; and

second means, coupled to the first means, for establishing a second threshold signal level, lower than the first threshold signal level, after the clutch is locked up so that the clutch is released at a vehicle speed lower than the speed at which the clutch is locked up, which second means is adjustable to regulate the vehicle speed at which the clutch is released.

4,478,323

HYDRODYNAMIC CLUTCH WITH TORSIONAL VIBRATION DAMPING

Helmut Weissenberger, Theilheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,369

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104307

Int. Cl.³ F16H *45/02*; F16D *3/14*

U.S. Cl. 192—3.3 **4 Claims**

1. A hydrodynamic clutch, such as a hydrodynamic torque converter, including a pump wheel impeller and a turbine impellar rotatable about a common axis and clutch means for

mechanically coupling said pump wheel impeller and said turbine impeller, said clutch means comprising:

a clutch-engaging countersurface and a clutch actuating device on said pump wheel impeller;

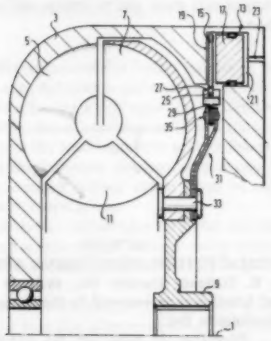
an annular friction disc on said turbine impeller;

said clutch actuating device operating to bring said friction disc and said countersurface into frictional contact with each other to engage said clutch means;

a pair of guide discs rotatively affixed with each other and with said turbine impeller;

an axially extending flange on one of said guide discs defining a radially outwardly directed guide surface;

an annular flange member engaged between said pair of guide discs arranged to be rotatable relative thereto, said annular flange having a radially inwardly directed annular shoulder which is located radially outwardly of and which is radially guided on said radially outwardly directed guide surface defined by said axially extending flange;



gear means comprising interengaging gear teeth formed on said annular flange member and said annular friction disc to effect torque transmission therebetween whereby torque transmission between said turbine impeller and said pump wheel impeller may be effected when said clutch means is engaged, said friction disc being supported through said gear means on said annular flange member so as to be rotatively fixed by axially displaceable relative thereto; and

spring means engaged between said annular flange member and said guide discs for damping torsional vibrations upon application thereto of forces generated as a result of relative rotative movement between said annular flange member and said guide discs;

said annular flange member and said guide discs being formed with circumferentially aligned windows through which said spring means extend and in which said spring means are held in torque transmitting engagement therebetween to effect said torsional vibration damping.

4,478,324

RESILIENT DRIVE MEANS FOR A CLUTCH

William H. Sink, Auburn, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Apr. 14, 1982, Ser. No. 368,265
Int. Cl.³ F16D *13/52, 13/68*
U.S. Cl. 192—70.17 **8 Claims**

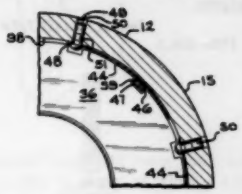
1. Driving means for a clutch device comprising:

a drive member having a circular flange, said circular flange containing at least one aperture;

a driven member;

an engaging plate means rotatable with and axially moveable relative to the drive and driven members, said engaging plate means having an outer periphery containing at least one slot;

a resilient member connected to said circular flange, said resilient member extending between said circular flange and said outer periphery of said plate engaging means, one end of said resilient member containing a pin that extends from said resilient member, said pin disposed for extending into and securely engaging said aperture in said circular flange, said resilient member being secured to said circular flange by said pin, said end of said resilient member adja-



cent said pin being in contact with said circular flange, said portion of said resilient member being adjacent a drive block and being in contact with said engaging plate means, said end of said resilient member spaced opposite said pin being in contact with said circular flange, whereby said resilient member reduces torsional and tumbling induced rattle in said clutch device; and

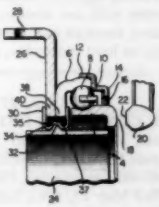
said drive block being positioned on said resilient member said block disposed for engaging said slot in said engaging plate means whereby said drive block drivingly connects said engaging plate means to said drive member.

4,478,325

SELF-ADJUSTING BEARING

Richard T. Dagiel, Elkgrove Village, Ill., assignor to Aetna Bearing Company, Chicago, Ill.

Filed May 1, 1981, Ser. No. 259,505
Int. Cl.³ F16D *23/14;* F16C *19/10*
U.S. Cl. 192—98 **10 Claims**



1. A clutch bearing assembly comprising: a carrier sleeve; a bearing arrangement having a first race means for engagement with a plurality of clutch fingers, a second race means, and a plurality of bearing elements disposed between said first and second race means; a carrier plate adapted for attachment to an actuator for shifting the bearing arrangement axially toward the clutch fingers; and mounting means for maintaining the said carrier plate and the bearing arrangement in assembly on said carrier sleeve, said mounting means permitting the carrier plate and the bearing arrangement to move radially relative to said carrier sleeve, while also permitting said bearing arrangement to move radially relative to said carrier plate with said mounting means maintaining the carrier plate and bearing arrangement in the assembled condition; such that any coaxial misalignment between the clutch fingers and the carrier sleeve may be accommodated by movement of the bearing arrangement relative to the carrier sleeve and the carrier plate, and also relative movement of the carrier plate relative to said

carrier sleeve when the first race means of the bearing arrangement is brought into engagement with said clutch fingers.

4,478,326

CLUTCH PLATE

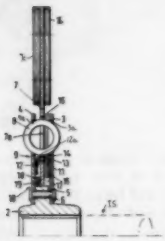
Gerhard Rotter, Obersasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,623

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121375

Int. Cl.³ F16D *3/14*

U.S. Cl. 192—106.2 **15 Claims**



1. A clutch plate, particularly for use in clutches for automotive vehicles, comprising a rotatable hub having two spaced-apart cheeks; a friction lining carrier interposed between and rotatable within limits relative to said cheeks; energy storing means interposed between said hub and said carrier to yieldably oppose angular movements between the carrier and said cheeks; a first friction generating unit interposed in the path of transmission of torque between said hub and said carrier and located intermediate said cheeks; and a second friction generating unit interposed in the path of transmission of torque between said carrier and said hub and located between said cheeks, said second unit comprising an axially resilient component and a friction generating component, said components being disposed at the opposite sides of said carrier and being in direct engagement with one another, at least one of said components extending through said carrier and said resilient component reacting, at least indirectly, against said hub.

4,478,327

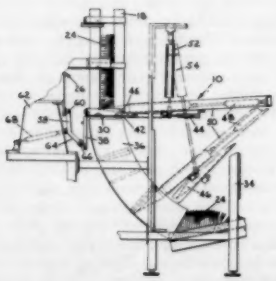
NEWSPAPER CONTAINER UNLOADING APPARATUS

Paul D. Siniscal, Hollis; J. Paige Benzing, Milford, both of N.H., and Louis G. Matte, Lowell, Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 27, 1982, Ser. No. 382,541

Int. Cl.³ B65G *11/20*

U.S. Cl. 193—40 **3 Claims**



1. Apparatus for transporting a stack of newspaper signatures from a first position inside a storage container having a pivotally mounted bottom to a second position spaced from said container for forming an imbricated stream, said apparatus comprising:

(a) supporting framework;

(b) a signature directing arcuate chute configured to receive signatures in a vertical direction and direct them in an arcuate path toward a horizontal path of travel; said chute having an elongated slot formed in one arcuate wall thereof;

(c) an elongated extensible support arm pivotally mounted on said frame so that the outer end thereof can be extended into said signature directing chute and moved through the arcuate length thereof;

(d) means to extend said extensible support arm into said arcuate chute to receive and change the position of said stack and to withdraw said outer end of said arm after said stack has been moved; and

(e) means to pivot said extensible support arm to change the position of said stack and to return said arm to said first position.

4,478,328

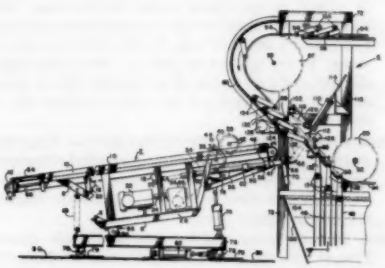
AUTOMATIC HIDE PROCESSING APPARATUS

Wolfgang K. Heiland, Trevose, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 23, 1981, Ser. No. 333,945

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—479 **3 Claims**

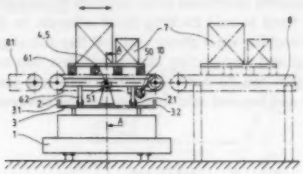


1. An apparatus for loading cattlehides and other like materials onto carrier bars, comprising a multiplicity of carrier and clamping means, each of which has a pair of locking clamps and a carrier bar, processing means for transporting said carrier and clamp means, for actuating the locking clamps, and for clamping a hide to a carrier bar, and means for conveying a hide to be loaded onto a carrier bar and for holding a carrier bar in position to be loaded, said conveying means having means for traverse movement and for being raised and lowered so that when the conveying means is in a forward position about one-half of the hide is run-in over the carrier bar and when the conveying means moves to a rearward position the rest of the hide is draped over the bar and the conveying means is then lowered to release the carrier bar, said apparatus being provided with means for coordinating the action of the carrier and clamping means with the processing and conveying means.

4,478,329
TRANSFER APPARATUS FOR PALLETS AND SIMILAR PIECE GOODS

Ulrich Heiz, Säriswil, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Apr. 16, 1982, Ser. No. 368,911
Claims priority, application Switzerland, May 5, 1981, 2901/81
Int. Cl.³ B65G 37/00, 21/10
U.S. Cl. 198—574 3 Claims



1. In a transfer apparatus for loads, especially pallets and similar piece goods, between a stationary chain conveyor and a conveyor device having a conveyor track extending perpendicular to the direction of conveyance of said stationary chain conveyor, wherein the load transfer is accomplished by means of a rail-bound displacement carriage which can be moved within a predetermined limited extent upon its support, the improvement which comprises:

said conveyor device including a transport vehicle;

said rail-bound displacement carriage being arranged to be displaceable upon said transport vehicle of said conveyor device;

said displacement carriage having a conveyor element arranged to be movable at approximately the same conveying plane as chains of said stationary chain conveyor and between neighboring conveyor chains of said stationary chain conveyor;

said conveyor element of said displacement carriage comprises a chain conveyor;

chain drive means arranged upon said displacement carriage;

said chain drive means driving conveyor chains of said chain conveyor of said displacement carriage; and

a brake-blocking device arranged upon said transport vehicle; and

said brake-blocking device selectively alternately establishing a rigid blocking connection between said transport vehicle and said displacement carriage and between said transport vehicle and said conveyor chains of said chain conveyor, respectively.

4,478,330
VERSATILE POCKET-SIZE CONTAINER

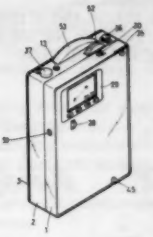
Ching H. Lin, 13 F., No. 137, Sec. 2 Nanking E. Rd., Taipei, Taiwan

Filed Sep. 27, 1983, Ser. No. 536,280
Int. Cl.³ A45C 11/00; B65D 85/38; G06F 15/02
U.S. Cl. 206—38 5 Claims

1. A versatile pocket-size container comprising:

an upper body having a tape measure, a mirror, an address pad, a note pad, a screw driver, an electronic game, a multi-purpose tool, a ruler, a lamp and a fragrant substance;

a lower body hinged together with said upper body, said lower body having a radio, a watch, a compass, an electronic calculator, a thermometer, a picture frame, a comb, an earpick, a world time chart, a number of needles, a reel of threads, a pen and a cigarette lighter; and

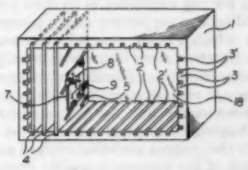


a cover hinged together with said lower body, said cover having a pair of clips by means of which a calendar, a conversion table and namecards are fixed in position.

4,478,331
CONTAINER FOR PRINTED-CIRCUIT BOARDS

Jean-Pierre Ruin, Vaucresson, France, assignor to Jean-Claude Robin, Vaucresson, France

Filed Jun. 29, 1982, Ser. No. 393,513
Claims priority, application France, Jul. 9, 1981, 81 13496
Int. Cl.³ B65D 73/00; B23Q 3/02
U.S. Cl. 206—334 10 Claims



1. A container for the storage for rectangular printed-circuit boards, comprising:

a rectangular prismatic box having an open side;

a plurality of rectangular plates insertable into said box through said open side; and

spacing means inside said box engageable by said plates for holding same substantially parallel to one another and to a pair of walls of said box, each of said plates being provided on at least one surface with a pair of guide tracks extending substantially parallel to a diagonal of the respective plate and with two sliders per guide track displaceable therealong over a major part of said surface for retaining a printed-circuit board therebetween with edges parallel to those of said plates by engagement of each board edge with a respective slider, said guide tracks being through-going slots, each of said sliders including a stem traversing an associated slot, a clip on said stem engageable with an edge of a printed-circuit board, and locking means for immobilizing said clip in a slected position along the associated slot, said stem having a head bearing upon a plate surface opposite said clip, said locking means comprising a lever pivotable on said stem and cammingly engageable with said clip for clamping the respective plate between said clip and said head, said clip having a grooved face confronting a plate surface provided with pointed teeth receivable in the grooves of said face, said teeth being arrayed along mutually perpendicular lines parallel to the sides of said plate.

4,478,332

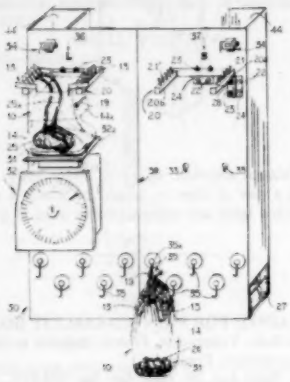
SPONGE ARRAYING AND DISPOSAL RECEPTACLE

K. Joyce Wiestmiller, Cobb County, Ga., assignor to M.D. Industries, Inc., Northbrook, Ill.

Continuation of Ser. No. 195,406, Oct. 9, 1980,. This application Mar. 8, 1982, Ser. No. 355,348

Int. Cl.³ B65D *83/10*

U.S. Cl. 206—361 **13 Claims**



1. A receptacle for soiled surgical sponges which comprises: a transparent bag; at least two chutes; a projection which is connected to each chute, each projection being attached to the bag; a means connected to each chute for detachably mounting the chute with the bag suspended in an open position between the chutes; and sponge supporting means comprising a plurality of prongs which extend generally upwardly from each chute and in a direction away from the front edge thereof, said supporting means receiving a plurality of sponges in an array in which each sponge extends over the front edge of one of the chutes and downwardly into the bag, so that only a small portion of each sponge is retained outside of the confines of the open bag while the sponges are being arrayed and counted and the bulk of each of the sponges is readily observable visually for its blood content.

4,478,333

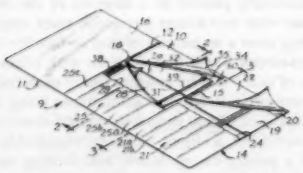
NEEDLECRAFT CASE WITH EXTENDER

Lorraine E. Dalbo, and Emil J. Dalbo, both of Atlanta, Ga., assignors to Dal-Craft, Inc., Atlanta, Ga.

Filed Feb. 8, 1983, Ser. No. 464,957

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—380 **8 Claims**



1. A storage case, for needlecraft materials and the like, said storage case comprising a backing sheet, a first hinge in said backing sheet for defining a first end section selectively foldable along said first hinge, a second hinge in said backing sheet for defining a second end section selectively foldable along said second hinge, said first hinge and said second hinge being parallel to each other and spaced apart so that a center section is defined between said first hinge and said second hinge, said first end section, said second end section and said center section being of generally equal width, a plurality of pockets carried by said backing sheet so that all pockets of said plurality of pockets are enclosed when said first end section and said second end section are folded over said center section one pocket of said plurality of pockets being located at the lower edge of said backing sheet and having an upper edge above said lower edge of said backing sheet, a first flap fixed to said backing sheet above said one pocket and extending towards and terminating adjacent to said upper edge of said one pocket so that an elongate object can be received within said one pocket and extend therefrom to be covered by said first flap, a second flap fixed to said backing sheet adjacent to the upper edge of said backing sheet above said first flap and aligned with said first flap and terminating above said first flap so that an elongate object can be received within said one pocket and extend over and beyond said first flap and be covered by said second flap.

4,478,334

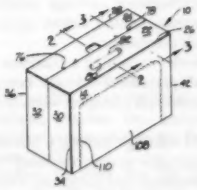
SLEEVE STYLE BEVERAGE PACKAGE

Earl J. Graser, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.

Filed Mar. 26, 1982, Ser. No. 362,209

Int. Cl.³ B65D *5/44*

U.S. Cl. 206—427 **4 Claims**



1. A sleeve-style beverage package, comprising:

(a) a bottom panel;

(b) a pair of side panels hingedly attached to opposite sides of the bottom panel;

(c) a pair of overlapping outer and inner top panels hingedly attached to opposite sides of the side panels;

(d) end flaps hingedly attached to opposite sides of the side panels;

(e) top and bottom glue flaps hingedly attached to opposite sides of the top and bottom panels;

(f) adhesive means, formed on the top and bottom glue flaps, for adhesively securing the end flaps to the glue flaps to enclose the ends of the package;

(g) primary top panel locking means formed on the overlapping top panels to lock the top panels together the primary top panel locking means comprising a plurality of male tabs on the outer top panel and a plurality of female tab receiving slots on the inner top panel; and

(h) handle means, formed in each overlapping top panel, the handle means comprising an elongated opening in the outer top panel designed for receipt of four fingers and an opening in the inner panel designed for receipt of a thumb, said finger opening and said thumb opening being adjacent and defining therebetween a double layered handle section and said finger opening and said thumb opening each having a handle tab hingedly secured thereto adjacent said double layered handle section to be folded down along the double layered handle section when fingers and a thumb are inserted into said finger and thumb openings and said handle means further comprising in part secondary top panel locking means to secondarily lock the top panels together, said secondary top panel locking means comprising a secondary male locking tab on said outer top panel which overlays the thumb opening and is inserted

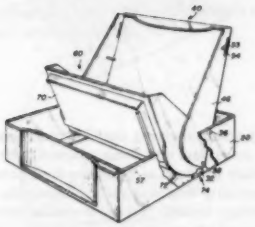
into the thumb opening when a thumb is inserted into the thumb opening.

4,478,335

FLOPPY DISKETTE STORAGE CONTAINER AND DISPLAY DEVICE

Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.

Filed Jun. 8, 1983, Ser. No. 502,188
Int. Cl.³ B65D *85/30*
U.S. Cl. 206—444 **15 Claims**



4. A storage and display unit for floppy diskettes and the like comprising:

means forming a generally rectangularly shaped base receptacle having an open top, a bottom and upwardly extending front, back and sidewalls, first pivot apertures near the top rear part of said side walls and first and second cam-stops each of which includes an upper surface and front and rear sides, each said cam-stop being mounted on the interior of said bottom adjacent one of said side walls;

cover means having an outer surface for providing a top surface for closing said open top of said base receptacle when in a closed condition and having an inner surface, said cover means having downwardly extending side walls each having an inner and outer surface, said side walls including first pivot pins on said outer surface thereof for pivotally mounting in said first pivot apertures, and second pivot apertures located at the top, rear portion of said side walls;

support means for providing a substantially flat upper support surface for disk storage or use, said support means having upwardly extending side walls in which second pivot pins are provided at an upper, rear location of an outer surface thereof, said second pivot pins being inserted in said second pivot apertures, said upwardly extending side walls providing the sides of a diskette storage container and the upper support surface and inner surface of said cover means providing, respectively, the bottom and top of said container, the support means also including a rear surface extending upwardly from said support means and at an angle therewith, said rear surface providing support for the diskettes when the storage unit is open for display, the front end being open for insertion or removal, of selected diskettes; and

camming means for engagement with said upper surface of said cam-stops, said camming means being adapted for attachment to said support means.

4,478,336

VARIABLE TEST AIR APPARATUS

Roger A. Thompson, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Nov. 15, 1982, Ser. No. 441,433
Int. Cl.³ B07C *5/10*
U.S. Cl. 209—588 **48 Claims**

1. A variable speed machine for continuous testing of one piece can body members having a sidewall portion, and a bottom wall portion at one end defining a container cavity, and an opening at the other end, and a formed flange portion at the other end surrounding the opening for subsequent association with a can closure member; the machine being adapted for testing the can body member for defects including pin holes in the sidewall portion and the bottom wall portion, and unwanted deformation and cracks in the flange portion, the machine being operable over a range of operating speeds and comprising:

frame and housing means for supporting and housing the machine components;

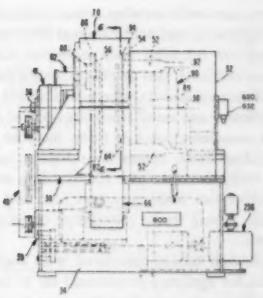
horizontally extending rotatable shaft means rotatably supported by said frame and housing means and providing a central axis of rotation;

motor means for causing continuous rotation of said rotatable shaft means;

can body member transfer wheel means mounted on said shaft means for rotation therewith and for carrying can body members in a circular path thereabout;

a plurality of pocket means circumferentially spaced about the outer periphery of said transfer wheel means for receiving a can body member in each pocket means and for transferring each can body member along said circular path during a portion of each revolution of said transfer wheel means;

in-feed means mounted on said frame and housing means for loading one can body member in each of said pocket



means during each revolution of said transfer wheel means;

light applying means for applying light to the exterior surfaces of each can body member in each of said pocket means, the light applying means being non-rotatably mounted relative to said transfer wheel means and located to provide a continuous light zone during each revolution of said transfer wheel means;

discharge chute means for receiving defective can body members from said transfer wheel means during each revolution of said transfer wheel means;

unloading chute means for receiving non-defective can body members from said transfer wheel means during each revolution of said transfer wheel means;

extendable and retractable means mounted on said shaft means for rotation therewith and being associated with each of said pocket means for axially moving a can body member in each of said pocket means between a first retracted position and a second extended position during a portion of each revolution of said transfer wheel means;

releasable holding means associated with each of said extendable and retractable means for abutting and releasable holding engagement with the bottom wall portion of a can body member in each of said pocket means during a portion of each revolution of said transfer wheel means;

sealing means mounted on said shaft means for rotation therewith and being associated with each of said pocket

means and each of said extendable and retractable means for sealable engagement with the flange portion of non-defective can body members carried in each of said pocket means and releasably held by said holding means, the holding means, being operative to effect holding engagement with the bottom wall of said can body member and the extendable and retractable means being operative from the first retracted position to the second extended position to effect sealable engagement of the flange portion of each can body member with the associated sealing means prior to movement of each can body member to said light zone;

light detection means non-rotatably mounted relative to said transfer wheel means and being located for successive axial alignment with each of said pocket means and the opening in the can body member carried thereby opposite said sealing means in the light zone for receiving light only from said light applying means through the can body member and between the flange portion and the sealing means and for generating a control signal upon receipt of light therefrom;

said extendable and retractable means being operative from the second extended position to the first retracted position to retract each can body member from sealable association with said sealing means after movement beyond said light detection means prior to reaching said discharge chute means during each revolution of said transfer wheel means;

defective can body member release control means effective in response to said control signal from said light detection means for releasing each defective can body member before reaching said discharge chute means during each revolution of said transfer wheel means;

non-defective can member release control means effective as each non-defective can body member approaches said unloading chute means for releasing each non-defective can body member and for enabling discharge of non-defective can body members into said unloading chute means during each revolution of said transfer wheel means;

pressurization means associated with each of said sealing means for applying pressurized air to said sealing means for obtaining minimal sealing area engagement between said sealing means and the flange portion of said can body members and for applying pressurized air through the opening to the interior of said can body member to outwardly flex the side wall portion and the bottom wall portion to enhance the passage of light through openings therein;

first passage means connected to a source of pressurized air for supplying pressurized air;

second passage means connected to each of said sealing means and connectable to said first passage means when each associated sealing means and pocket means are located in said light zone for pressurizing said sealing means and a can body member associated therewith in the light zone and prior to movement into axial alignment with said light detection means;

rotational speed monitoring means for monitoring the speed of said rotatable shaft means and providing a speed monitor signal;

processing means for receiving and processing said speed monitor signal and providing a processed control signal in response thereto for actuating control valve means; and

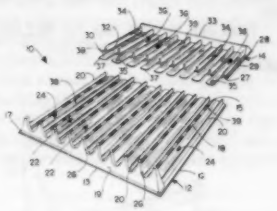
control valve means operably connected in fluid communication with said first passage means and said second passage means for controlling the pressure of air provided to said sealing means responsive to changes in speed of said rotatable shaft means.

4,478,337

ADJUSTABLE SHELVING UNIT

Paul Flum, University City, Mo., assignor to Paul Flum Ideas, Inc., St. Louis, Mo.

Filed Jun. 29, 1982, Ser. No. 393,462
Int. Cl.³ A47F 7/00
U.S. Cl. 211—49 D 19 Claims



1. An adjustable shelving unit for merchandising products arranged in rows, said unit being adapted to be positioned on a sloping surface to serve as a gravity feed product dispensing system comprising first and second relatively movable members each being formed having a similar number of spaced parallel adjacent channels extending thereacross in one direction and each having end wall means formed extending across one end thereof to form an end wall for the channels thereon, said channels including bottom wall portions and spaced upstanding side wall portions extending across said first and second members to form separators between the adjacent channels, the upstanding side wall portions on said second member having cross-sectional shapes adaptable for slidably receiving and engaging the upstanding side wall portions on said first member to enable said first and second members to be arranged in telescoping relationship with each other, said plurality of adjacent channels associated with said first member being in alignment with said plurality of adjacent channels associated with said second member when said members are engaged to form continuations thereof whereby said first and second members can be moved relative to each other to achieve a desired length for said channels, at least one product supporting track member positioned in and extending along the channels in each of said first and second members to engage and support products positioned thereon, the product supporting track members on said second member extending beyond one end of the channels formed therein to overlap portions of the respective product supporting track members on said first member.

4,478,338

DISPLAY DEVICE OF THE TYPE HAVING RACKS ARRANGED IN SHINGLED FASHION

Louis J. Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed Dec. 9, 1982, Ser. No. 448,396
Int. Cl.³ A47F 7/00
U.S. Cl. 211—490 4 Claims

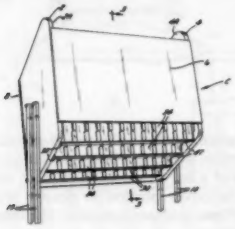
1. A point of purchase merchandise display device comprising a cabinet that has laterally spaced upright and parallel side walls, and a plurality of merchandise supporting racks, each having top and bottom ends and extending laterally across said cabinet substantially from one to the other of its side walls, each said rack comprising a rear wall and laterally opposite side wall portions that project forwardly from said rear wall and are flatwise inwardly adjacent to said side walls of the cabinet, and each said rack being movable to and from a display position in the cabinet in which its rear wall extends in a near vertical but downwardly and forwardly inclined direction, said racks when in their display positions being disposed one behind the other and at elevations such that their several bottom ends are stepped downwardly and rearwardly to have

merchandise in the bottom portion of every rack accessible for forward removal therefrom, said display device being characterized by:

A. each of said side walls of the cabinet having in its surface that opposes the other a groove for each of said racks, each said groove extending in said direction and the two grooves for each rack being opposite and opening toward one another;

B. a pair of coaxial pins on each rack, each projecting laterally outwardly from one of said side wall portions of the rack, said pins being slideably received in said grooves for the rack and each said pin being located near the top of the rack and forwardly adjacent to said rear wall of the rack; and

C. a pair of brackets for each rack, one for each side of the rack, each said bracket having



(1) an attachment portion secured to the side wall of the cabinet at its side of the rack,

(2) a back supporting portion projecting laterally inwardly from the cabinet side wall to which the bracket is secured, rearwardly adjacent to the bottom of the groove for its rack, and against which the back wall of its rack is engageable, and

(3) a hook-like clip portion which projects forward and upward from said back supporting portion and which is engageable with a bottom edge portion of the rear wall of the rack to cooperate with the pins and said back supporting portion in maintaining the rack in its display position, the rack being disengageable from said clip portion by lifting and forward motion of its bottom end so that the rack can be lowered to a stocking position in which its pins are near its brackets and the clip portions of its brackets engage the rear surface of its rear wall.

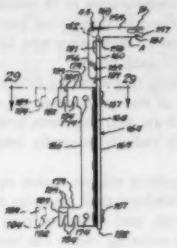
4,478,339

OFFICE ACCESSORY SYSTEM FOR USE ON BOTH HORIZONTAL AND VERTICAL SURFACES

Francis V. Herr, Kenmore; Thomas B. Walklet, Williamsville, both of N.Y.; James G. Hansen, Winnetka; Theodore J. Hasler, Chicago, both of Ill.; Valentin Beil, East Aurora; Harold E. Donlon, Grand Island, both of N.Y., and Ken E. Christian, Harrietsville, Canada, assignors to McDonald Products Corporation, Buffalo, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,259
Int. Cl.³ A47F *3/14*
U.S. Cl. 211—126 **11 Claims**

1. A support hook for interfitting with office accessories having recess means with a detent therein for snap-fit engagement with said hook for mounting such accessories in a vertical orientation on a vertical surface, said hook comprising angularly related legs, one of said legs being adapted for insertion in such recess means, said one leg being bifurcated and having a recessed outer edge portion adapted to snap-fit over such



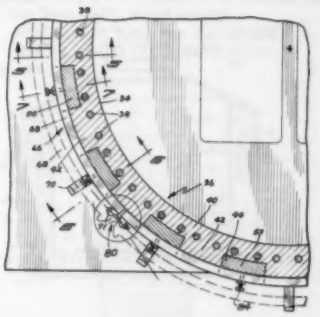
detent, and the other of said legs being engageable with mounting means on such vertical surface.

4,478,340

SWING BEARING QUICK REMOVAL SYSTEM

Pierre C. Delago, Afton, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed Apr. 26, 1982, Ser. No. 372,073
Int. Cl.³ B66C *23/84*
U.S. Cl. 212—253 **3 Claims**



1. In a crane having an upper works rotatably supported on a vertical axis on a lower works by an anti-friction bearing having inner and outer races, a quick removal and assembly structure, said structure including:

an upper mounting ring and a lower mounting ring;

one of said mounting rings being integrally mounted with respect to a first of said works, the other ring being concentrically and integrally mounted with respect to a first of said bearing races, and a second of said bearing races being integrally mounted with respect to a second of said works;

said upper mounting ring having a solid toroidal portion and a plurality of teeth extending away from the toroidal portion, each tooth having a radially outwardly opening horizontal slot therein;

said lower mounting ring having a solid toroidal portion and a plurality of teeth extending away from the toroidal portion, each tooth having a radially outwardly opening horizontal slot therein;

said upper and lower mounting rings being so shaped and said upper and lower teeth being of configuration so that the upper and lower ring teeth nest with each other and the upper ring is supported on the lower ring when said upper works is assembled to the lower works;

the slots in the upper and lower teeth together defining a

horizontal retaining ring groove in said teeth when said works are so assembled;

a retaining ring constituted as a plurality of retaining ring segments of configuration to fit into said upper and lower ring teeth defined retaining ring groove to prevent relative movement of said upper and lower mounting rings with respect to each other;

releasable retaining ring securing means operative on every adjacent pair of end portions of all of the retaining ring segments to draw said segments toward each other and simultaneously radially inwardly into said retaining ring groove; and

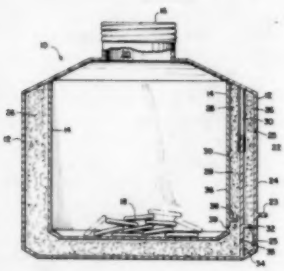
positive ring segment release means operable to forceably completely withdraw each retaining ring segment radially outwardly from said retaining ring groove when said retaining ring securing means has been released.

4,478,341

TAMPER-RESISTANT CONTAINER

Avvari Rangaswamy, 13 Eastern Dr., Littleton, N.C. 27850

Filed Aug. 8, 1983, Ser. No. 521,419
Int. Cl.³ B65D *8/06*
U.S. Cl. 215—12 R **5 Claims**



1. An access system for a tamper-proof package comprising:

a double walled container, with both the inner and outer walls of said double walled container being continuous subsequent to the filling of said container;

a port for filling said container, which port is permanently sealed subsequent to the filling;

a layer of compliant tamper-indicating material filling the volume between said inner and outer walls,

an outer access wall section located on said outer wall, the area of said outer access wall section being defined by means permitting reduced resistance to removal of said outer access wall section from said outer wall;

a shutter mounted in a grooved track between said outer wall and said inner wall, said shutter further being located between said outer access wall section and said inner wall with a layer of said compliant tamper-indicating material between said shutter and said outer access wall section and a layer of said compliant tamper-indicating material between said shutter and said inner wall, said shutter being moveable in said groove track so as to be removed from the area between said outer access wall section and said inner wall;

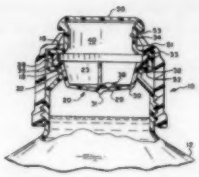
an inner access wall section located on said inner wall, the area of said inner access wall section being defined by means permitting reduced resistance to removal of said inner access wall section from said inner wall.

4,478,342

STERILIZABLE CONTAINER WITH INNER CLOSURE AND COLLAPSE-RESISTANT COVER

Glenn L. Slater, Ingleside; Gerhard H. Weiler, South Barrington; Robert Turoff, Wheeling, and Lawrence Kitterman, Antioch, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill., by said Slater, Turoff and Kitterman

Filed Jul. 14, 1983, Ser. No. 513,593
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—32 **32 Claims**



1. In a one-piece, hermetically sealed plastic container having a body portion, a neck portion, a cover portion closing the neck portion and a line of weakness defined between the neck portion and the cover portion to permit separation of said cover portion from said neck portion, the improvement comprising, in combination:

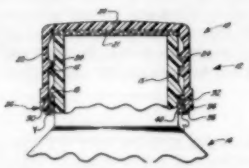
a separately formed inner closure carried by and removable with said cover portion, said inner closure being disposed to seal said neck portion below said line of weakness to prevent the container contents from entering the area of said line of weakness during shipping, storing and handling of the container.

4,478,343

TAMPER-INDICATING CLOSURE

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Molded Products Company, Richmond, Va.

Filed Sep. 23, 1982, Ser. No. 422,096
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **21 Claims**



1. An integrally-formed tamper-indicating thermoplastic closure for fitment to a container having a threaded neck portion and an outwardly extending annular flange adjacent to and beneath the threaded neck portion, said tamper-indicating closure comprising:

a. a top wall;

b. an annular sidewall downwardly depending from said top wall, said sidewall having about its inside surface a closure thread for cooperation with said container thread to achieve fitment of said closure to said container;

c. an annular tamper-indicating band connected to the lower portion of said annular sidewall by way of an annular frangible area, said annular tamper-indicating band having,

(i) an annular upper portion depending downwardly from said annular frangible area;

(ii) a circumferentially flexible annular lower portion

comprising a plurality of spaced apart tabs with each tab connected to its neighboring tab by way of a flexible web, and

(iii) an annular intermediate portion which provides an annular hinge to hingedly connect said annular upper portion and said annular lower portion one to the other whereby said annular lower portion can be folded inwardly and upwardly to position said tabs in a position of interference with said container annular flange when said closure is fitted to said container.

4,478,344

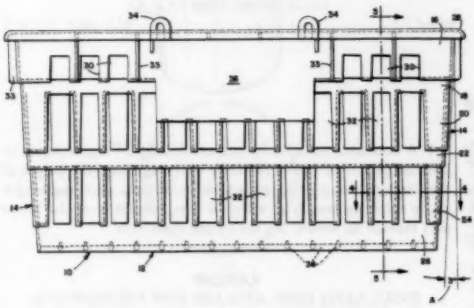
HAND CARRYING BASKET

Houston Rehrig, 4010 E. 26 St., Los Angeles, Calif. 90023

Filed Jan. 28, 1983, Ser. No. 461,933

Int. Cl.³ B65D *21/04*

U.S. Cl. 220—83 **6 Claims**



1. An integrally-formed plastic basket including a bottom wall and a plurality of outwardly tapering side walls defining an opening, each of said side walls comprising:

a corrugated cross-member having first panels lying generally inward of a centerline of said corrugated cross-member and including first slots and second panels lying generally outward of the centerline of said corrugated cross-member and including second slots;

an unslotted, substantially planar upper cross-member contacting the upper edge of said corrugated cross-member and forming a top edge of said second slots, said second slots having no bottom edge; and

an unslotted, substantially planar lower cross-member contacting the bottom edge of said corrugated cross-member and forming a bottom edge of said first slots, said first slots having no top edge.

4,478,345

SELF-CONTAINED CONTAINMENT FOR GAS CYLINDER

William J. Edinger, Basin #3, Clipper Yacht Harbor, Sausalito, Calif. 94965

Filed Jun. 27, 1983, Ser. No. 508,116

Int. Cl.³ B65D *8/22, 25/20*; F16J *13/02*

U.S. Cl. 220—85 P **3 Claims**

1. A containment for a gas cylinder in use as a supply of gas to an appliance, with an outlet valve at one end of said cylinder, comprising:

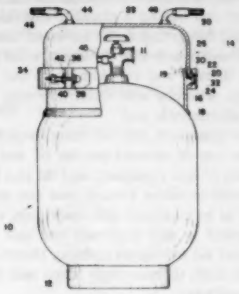
an annular, generally coaxial wall on said one end of said cylinder surrounding said outlet valve;

a weldment securing said wall to said cylinder and sealing completely around and between said wall and cylinder;

a circular top closure with a depending annular rim adapted to seal on and around said annular wall;

a supply gas duct to be connected to said outlet valve and extending from said top closure;

an exhaust gas duct opening from said top closure;



a seal ring positioned between said rim and said wall; and releasable means for securing said rim and wall together in sealed relationship.

4,478,346

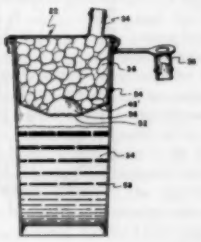
ICE-HOLDING AND GAME-ADAPTABLE INSERT CUP FOR DRINKING CONTAINER

Gary W. Spong, Vallejo, Calif., assignor to Antonio Valentino Pannutti, San Jose, Calif., a part interest

Filed Apr. 19, 1982, Ser. No. 369,558

Int. Cl.³ A47G *19/22*; B65D *90/04*

U.S. Cl. 220—90.2 **4 Claims**



1. A drinking container assembly comprising;

a cup-shaped drinking container having a bottom, an integral cylindrical side wall, and an open top for holding a drinking beverage, said side wall comprising a layer of a single thickness, having an upper rim, and being thin enough at said upper rim area thereof to fit partially into the mouth of a person such that said person can easily and comfortably drink from said container;

an insert cup for said drinking container, said insert cup being cup-shaped and sized to fit in an upper portion of said drinking container,

said insert cup being capable of holding a temperature-altered solid body,

said insert cup having at least one opening for allowing the beverage in said container to pass through said insert when said assembly is inverted, said opening of said insert cup being large enough to allow said beverage to pass therethrough at a sufficient rate for regular human beverage drinking,

said insert cup having means for holding itself at an upper portion of said container when said insert cup is placed into said container so as to hold said insert cup above the beverage in said container,

said insert cup having a cylindrical side wall, the diameter of

which is slightly less than the diameter of said side wall of said container so that when said insert cup is nested into said container, said side wall of said insert cup will lie adjacent said side wall of said container, said side wall of said insert cup having a plurality of folds therein which permit said insert cup to be inverted, the bottom of the inside of said insert cup having a solid projectile body attached thereto and extending into the interior of said insert cup, whereby said insert cup may be inverted for use as a shuttlecock; and

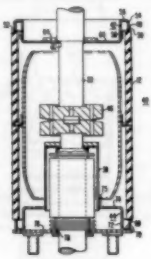
a lid for said container, said lid being shaped and sized to fit across the top of, around the rim of, and partially down the outside of said container, said lid also being shaped so as to be self-retentive around said rim area of said container so as to captivate said insert cup when said insert cup is nested in said container and said container is inverted, said lid having an opening therein for allowing a person to drink therethrough when said lid is in position on said container.

4,478,347

UNITARY END CLOSURE AND SEAL SHIELD MEMBER FOR VACUUM INTERRUPTER

Sidney J. Cherry, Elmira, and Richard A. White, Horseheads, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1981, Ser. No. 228,040
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **4 Claims**



1. An improved vacuum circuit interrupter in which a cylindrical envelope is hermetically sealed by end members to maintain a vacuum within the sealed envelope, with a fixed support rod sealed through one end member and supporting a fixed contact within the envelope, and a movable support rod sealed to one end of a bellows seal member the other end of the bellows seal member sealed to the end member with the support rod passing through the opposed end member and supporting a movable contact within the envelope, with a central cylindrical arcing shield disposed within the envelope about the contacts, and arcing end shields extending from the respective end members, the improvement wherein the end member at the fixed support rod end comprises a first unitary end closure and arcing end shield comprising a first cylindrical portion of a diameter equal to the envelope diameter, one end of the first cylindrical portion sealed to one end surface of the cylindrical envelope, with the other end of the first cylindrical portion being continued in a radially inwardly directed transverse portion continued in a second cylindrical portion of a diameter less than the cylindrical envelope and greater than the diameter of the central cylindrical arcing shield, the second cylindrical portion includes a radially inwardly extending base portion fitted within the cylindrical envelope, the base portion is sealed to the fixed support rod.

4,478,348

CHILD RESISTANT CONTAINERS

Norman Cook, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 30, 1982, Ser. No. 413,108
Claims priority, application United Kingdom, Sep. 1, 1981, 8126443
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—318 **4 Claims**

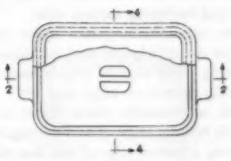
1. A container suitable for and containing detergent liquid or powder provided with a lid and a carrying strap, the length of the carrying strap being adjustable between a carrying length and a securing length at which it is in tension over the lid or part thereof to secure the lid on the container.

4,478,349

INSULATED DISH AND LID FOR MICROWAVE COOKING

Walter K. Haverland, Jr., and Patricia L. Haverland, both of Livermore, Calif., assignors to Mirro Corporation, Manitowoc, Wis.

Continuation of Ser. No. 2,875, Jan. 12, 1979, abandoned. This application Dec. 23, 1980, Ser. No. 220,192
Int. Cl.³ B65D *25/18;* H05B *6/64;* A47J *27/00*
U.S. Cl. 220—410 **5 Claims**



1. A microwave cooking vessel comprising:

an outer container having a plastic floor and plastic walls;

an upper rim forming the upper periphery of said outer container, said upper rim being beveled;

at least one handle extending outwardly from said outer container at a point below said upper rim;

an inner container having a plastic floor and plastic walls;

a flange extending outwardly from and circumscribing the upper periphery of said inner container, said flange including a groove having a shape corresponding to said rim;

said rim frictionally engaging said groove so that said inner container is removably supported within said outer container to define a fluid containing cavity between the floor and walls of said inner container and the floor and walls of said outer container; and

said groove and said upper rim cooperating by relative movement therebetween to provide valve means for allowing fluid to escape from said cavity whereby said

groove defining flange moves upwardly to disengage said upper rim from said groove when said fluid containing cavity is heated, and said groove defining flange moves downwardly to sealingly engage said upper rim when said cavity is cooled.

4,478,350

SPHERICAL CONTAINER OR CHAMBER

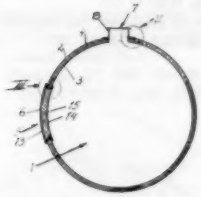
Johnny Ohlsson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Sep. 11, 1981, Ser. No. 301,344

Claims priority, application Sweden, Sep. 26, 1980, 8006726

Int. Cl.³ B65D *90/02, 81/02*

U.S. Cl. 220—436 **5 Claims**



1. An improved substantially spherical container or chamber for confining the increase in pressure and the fragments produced by explosion, deflagration or detonation of explosive substances, said container comprising:

an outer substantially spherical container shell dimensioned for absorbing said increase in pressure;

an inner, substantially spherical container shell dimensioned for withstanding said fragments;

first means, comprising a shock absorbent plastic layer positioned between said inner and outer container shells, for preventing rigid interconnection between said inner and outer container shells, there being no point of connection between said container shells which would force said inner container shell to vibrate in phase with said outer container shell and attain critical values;

at least one opening through said inner and outer shells and said layer; and

at least one door for said at least one opening, said door comprising:

an outer door shell also dimensioned for absorbing said increase in pressure;

an inner door shell also dimensioned for withstanding said fragments;

second means, comprising a shock absorbent plastic layer positioned between said inner and outer door shells, for preventing rigid interconnection between said inner and outer door shells, there being no point of connection between said door shells which would force said inner door shell to vibrate in phase with said outer door shell and attain critical values;

third means, extending between said at least one door and said outer container shell, for locking said outer door shell to said outer container shell; and

fourth means, extending between said at least one door and said inner container shell, for locking said inner door shell to said inner container shell while preventing said inner shells from vibrating in phase with said outer shells.

4,478,351

COMPOUND PACKING CONTAINER

Yoshihiro Homma, Urawa, Japan, assignor to Hokkai Can Co., Ltd., Tokyo, Japan

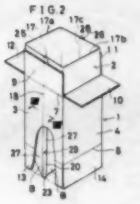
Filed Nov. 10, 1982, Ser. No. 440,527

Claims priority, application Japan, Nov. 11, 1981, 56-166966[U]

Int. Cl.³ B65D *90/04*

U.S. Cl. 220—462 **1 Claim**

FIG. 2



1. A compound packing container consisting of an outer casing made of a paper material having a series of adjacent first, second, third and fourth side panels arranged to be formed into a tubular drum portion, first, second, third and fourth upper flaps and first, second, third and fourth lower flaaps which extend respectively upwards and downwards from said first, second, third and fourth side panels through an upper horizontal fold and a lower horizontal fold, a pair of opposite vertical folds in the vertical center portions of the first side panel, the first upper flap and the first lower flap and in the vertical center portions of the third side panel, the third upper flap and the third lower flap, the outer casing being formed into a tubular shape by connecting both ends of the series of the side panels such that the tubular shape may be folded and unfolded into a flat tubular condition and an expanded open square tubular condition, respectively, at the opposite vertical folds; and a flat, inner bag member made of a rectangular waterproof sheet arranged to be contained in the outer casing having front and rear sheet portions, opposite side edges extending along on the whole length of the opposite vertical folds of the outer casing, a closed bottom edge and an open top edge having an opening defined by the front and rear sheet portions, both sides of an intermediate portion of the inner bag member being adhered to the inner surfaces of the side panels of the outer casing, both surfaces of each of both corner portions around the corners on both ends of the bottom edge being adhered respectively to the first and third lower flaps at each of two triangular adhesion regions on the first and third lower flaps having apexes at the lower ends of the vertical folds of the outer casing, and the opposite side edges of the inner bag member having adhered sealed portions inwardly bent and being adhered at their bent surface portions to the inner surfaces along on the vertical folds of the outer casing in its flat tubular condition.

4,478,352

INTEGRATED CIRCUIT COMPONENT HANDLER SINGULATION APPARATUS

Arlon J. Amundson, St. Paul, and Robert J. Wurscher, Shoreview, both of Minn., assignors to Micro Component Technology, Inc., Shoreview, Minn.

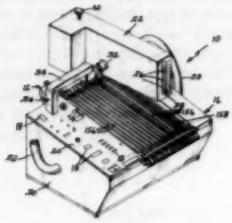
Filed May 19, 1982, Ser. No. 379,892

Int. Cl.³ B65H *3/24, 7/14;* **B07C** *5/02*

U.S. Cl. 221—13 **11 Claims**

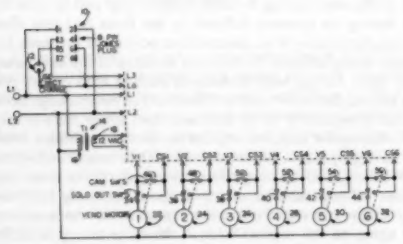
1. Apparatus for consecutively feeding semi-conductor component carrier units to the test site of a handler, which site electronically interfaces with a tester, said apparatus comprising:

(a) a track having a surface along which carrier units move to a bottom end thereof;
(b) a conveyor for transferring carrier units from said bottom end of said track to the test site, said conveyor having a station positionable laterally adjacent said bottom end;
(c) an elongated, reciprocally movable pusher bar for urging a carrier unit at said bottom end of said track into said station;
(d) a bell crank having first and second intersecting arms and being disposed for pivoting generally about an intersection of said arms, one end of said pusher bar being pivotally attached to a first of said arms at a location spaced from a point about which said bell crank pivots; and



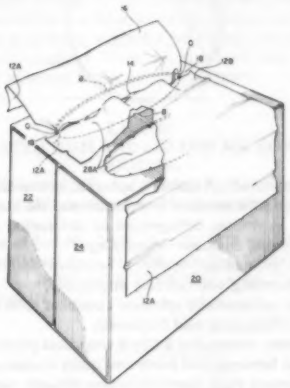
(e) a solenoid having a telescoping shaft and being operatively initiatable by an electronic signal to retract said shaft, said shaft having a remote end pivotally attached to a second of said arms at a location spaced from said point about which said bell crank pivots;
(f) wherein, as said shaft telescopes, said bell crank pivots to actuate said pusher bar to urge a carrier at said bottom end of said track into said station.

4,478,353
VENDOR CONTROL SYSTEM
Joseph L. Levasseur, St. Louis, Mo., assignor to H. R. Electronics Company, St. Louis, Mo.
Filed Feb. 26, 1982, Ser. No. 352,938
Int. Cl.³ G07F 5/22
U.S. Cl. 221—14 **14 Claims**



1. In a vend control system having means to accept and accumulate amounts of credit entered by a customer, a plurality of vend delivery means each having a product associated therewith and being selectively energizable to vend such product, and selection means actuatable by the customer to select a particular product from among the products that are available to be vended, the improvement comprising common circuit means associated with all of the vend delivery means and the selection means, a plurality of means each associated with a respective vend delivery means and operable when the supply of products to be vended under control of the respective vend delivery means becomes exhausted during a particular vend cycle to prevent the energizing during future vend cycles of said respective vend delivery means but not of others of said vend delivery means, and other means to maintain the selected vend delivery means energized for a full cycle of operation even if during a particular vend cycle the one of said plurality of means associated with the respective selected vend delivery means operable to prevent the further energizing of the selected vend delivery means operates thereby indicating that the supply of the product associated with such selected vend delivery means has become exhausted, said other means including a plurality of switch means each associated with a respective vend delivery means and operating under control thereof to cycle between two conditions during a complete operating cycle of the energized vend delivery means, means in said common circuit means operatively connected to all of said switch means and responsive to the operation of any of said switch means to effect maintenance of energization of the energized vend delivery means for a full cycle of its operation.

4,478,354
MELTBLOWN MICROFIBER WIPER PACKAGE, DISPENSING SYSTEM THEREFOR
Patrick J. Notheis, Marietta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jun. 1, 1982, Ser. No. 383,660
Int. Cl.³ A47K 10/20
U.S. Cl. 221—34 **2 Claims**



1. A combination carton and shipping package for shipping, storing and dispensing in pop-up fashion a series of folded meltblown microfiber material wipers therefrom, the surface of said wipers exhibiting a substantially high abrasion resistance characteristic between abutting surfaces which occurs in said folded state, said package comprising:

a. a pair of interfolded meltblown microfiber wiper webs disposed in zig-zag configuration in a storage compartment of said package as a stack of wipers; each of said webs being comprised of a plurality of folded wipers serially connected by transverse perforation teeth to form a substantially continuous web, each of said folded wipers being transversely folded into a plurality of zip-zag folds forming a first half-size segment, at least one intermediate full-size segment, and a second half-size segment; said perforation teeth being disposed between the second half-size segment of a leading wiper and the first half-size segment of a trailing wiper; said interfolded webs comprising a first web superposed over and physically adhered to a second web of said pair of webs, said first web being offset from said second web in a manner whereby the leading wiper of said second web lags the leading wiper of said first web; wherein said first and second interfolded webs have pattern imprints thereon formed from a pattern and anvil roll imprinting means; wherein said pattern roll surface of said first web is superposed upon said pattern

roll surface of said second web; and wherein said pattern roll surface has a slightly greater imprint depth than the imprint of an anvil roll surface providing larger standoff indentations on the pattern roll side than if the depth of imprint was equal to the anvil roll imprint, reducing the coefficient of friction between the webs when the first and second webs are interfolded; and

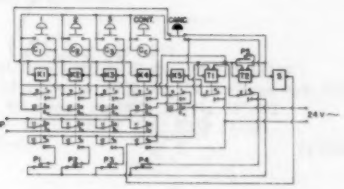
b. dispensing means for initiating breakage of the perforated teeth connecting said wipers in each of said continuous webs; said dispensing means including means for opposing physical adherence of said first web to the surface of said second web; the transverse perforation teeth of said first web being disposed midway between the transverse perforation teeth of the second web and vice versa; said dispensing means permitting the consumer to start the leading wiper of the first web being dispensed with his fingers; said dispensing means being responsive to physical force exerted on said leading wiper in said stack of wipers during the occurrence of removing said leading wiper from said stack.

4,478,355

SOFT DESSERT DISPENSING ARRANGEMENT

Leif Houman, Oyster Bay, N.Y., assignor to Medetec Industries, Inc., Locust Valley, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,217
Int. Cl.[3] B67D *5/08*; G04C *23/38*
U.S. Cl. 222—54 **9 Claims**



1. A soft dessert dispensing arrangement comprising:

a. dispenser means, responsive to manual actuation by an operator, for dispensing soft dessert over a given time period, including a timer for measuring the given time period, said timer comprising an electrical timing circuit which is responsive to a resistance value to determine a measured time period; and

b. compensator means coupled to said timer for adjusting the given time period to compensate for changes in the dispensing operation to provide for the dispensing of a substantially constant quantity of dessert by adjustment of the given time period, said compensator means including means for changing the resistance applied to said electrical timing circuit, and said compensator means also including a timer means for timing the duration since the last vending operation of soft dessert and being responsive thereto for changing the resistance applied to said electrical timing circuit.

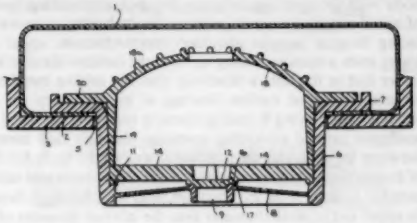
4,478,356

FLEXIBLE-BAG SELF-CLOSING METERING DISPENSING VALVE

Stanley L. Roggenburg, Jr., Staten Island, N.Y., and Robert H. Laauwe, Franklin Lakes, N.J., assignors to Essex Chemical Corporation, Clifton, N.J.

Filed Jun. 24, 1982, Ser. No. 391,846
Int. Cl.[3] B65D *35/22*; B05B *11/04*
U.S. Cl. 222—94 **3 Claims**

1. A self-closing dispensing valve for a flexible bag containing a fluid product and having a wall in which a dispensing hole is formed; said valve having a first integral part comprising a first tubular wall having a flange at one end and which flange is adapted to be sealed to the flexible bag wall around the hole with the flange extending radially outwardly from the first tubular wall, the first tubular wall having an outer end closed by an elastically flexible diaphragm having a dispensing hole and inwardly from the diaphragm having an internal shoulder facing away from the diaphragm; a second integral part comprising a valve head positioned so as to close the



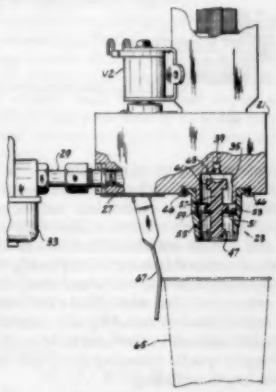
diaphragm's hole and mounted by spokes extending radially from the valve head to a ring encircling the outer ends of the spokes and with the ring seating on the shoulder of the first tubular wall; and a third integral part comprising a second tubular wall fitting inside of the first tubular wall and having one end seating on the ring of the second integral part and its other end closed by an elastically collapsible dome centrally having a normally open hole.

4,478,357

CITRUS FRUIT JUICE DISPENSING APPARATUS

William K. Jenkins, Hazelwood, Mo., assignor to Multiplex Company, Inc., St. Louis, Mo.

Filed Mar. 3, 1983, Ser. No. 471,872
Int. Cl.[3] B67D *5/56*
U.S. Cl. 222—135 **4 Claims**



1. Apparatus for reconstituting citrus fruit juice concentrate with water and dispensing the reconstituted citrus fruit juice into a cup comprising a refrigeration chamber for holding a container of concentrate at a temperature somewhat above its freezing temperature, e.g. 35°–40° F., the chamber having means for continuous circulation of cold carbonate water therethrough for refrigeration, the container having an outlet for the concentrate and an inlet for air under pressure for pressurizing the concentrate, dispensing valve means having a mixing nozzle extending downwardly therefrom, a passage for flow of concentrate to the nozzle and a passage for flow of

water to the nozzle, the flow of concentrate being controlled by the air pressure, means for regulating the pressure of tap water supplied to the nozzle to control the flow of water to the nozzle, said mixing nozzle comprising a tubular body for entry of concentrate and water at the upper end thereof and exit of concentrate mixed with water at the lower end thereof, said body having a central hub at the lower end thereof and spokes extending between the hub and the peripheral wall of said body with the openings between the spokes providing for exit of mixed concentrate and water, said body having an upwardly facing internal annular shoulder intermediate its upper and lower ends, a stem extending up from the hub and secured at its lower end in the hub, a relatively thin flat mixing member of circular scalloped outline bearing at its periphery on said shoulder and having a central opening receiving the stem, the scalloped outline providing openings through said member between the stem and the peripheral wall of the body for flow of concentrate and water, means on the stem above said mixing member holding it on the shoulder, said stem having a head at its upper end of small diameter than the internal diameter of the body at its upper end, said head having a recess therein, the passage for flow of water discharging it into the nozzle between the head and the peripheral wall of the body, the passage for concentrate discharging it down into the recess in said head for dispersion of the concentrate radially outwardly and mixing thereof with the water.

4,478,358

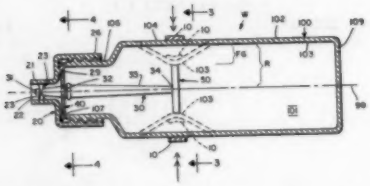
DISPENSING CLOSURE MECHANISM FOR RESILIENTLY SQUEEZABLE RECEPTACLES

Gerald F. Lantry, 2002 Ave. G., Council Bluffs, Iowa 51501

Continuation-in-part of Ser. No. 399,268, Jul. 19, 1982, abandoned. This application Mar. 16, 1983, Ser. No. 475,749

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—213 **20 Claims**



13. In combination with an elongate receptacle for fluid and that includes resiliently deflectable wall means surrounding a longitudinally extending central-axis and includes as its two longitudinal separated terminii a leadward open-neck surrounding and a trailward closed bottomwall intersecting said central-axis, a removably secured dispensing closure mechanism for the receptacle open-neck and comprising:

A. cap means provided with a leadward outlet-opening for fluid delivery and surrounding said central-axis and being removably secured to the receptacle open-neck;

B. an elongate spindle extending along said central-axis, said spindle length including:

i. a lead-end located trailwardly of and providing the spindle nearest proximity to the cap means outlet-opening,

ii. a leadward-length located trailwardly of said lead-end and being surrounded by the receptacle open-neck, and

iii. a trailward-length located trailwardly of said leadward-length and terminating at the spindle trail-end;

C. a yieldable seat for the spindle and located in surrounding relationship to the spindle nearer to the lead-end than to the trail-end thereof;

D. said receptacle deflectable wall means between said receptacle terminii being provided with visual indicator means to indicate where manual pressure is to be correctly exerted for causing ultimate fluid delivery through the outlet-opening; and

E. a rim type shoulder surrounding and attached to the spindle remotely trailwardly of said yieldable seat, said shoulder being co-longitudinal with said visual indicator means and being normally-directionally offset from the spindle whereby a finite-gap exists between said shoulder and said visually indicated wall means, whereby maintenance of manual pressure exerted against the visually indicated wall means contacts the rim type shoulder causing it and the spindle to move so as to thereby overcome the yieldable seat to permit fluid flow past the spindle leadward-length and thence ultimately through the cap means outlet-opening.

4,478,359

METHOD OF FORMING AND INSERTING COLLAR STAYS

William O. Mitchell; Walter W. Frost, and C. Ray Hamilton, all of Vidalia, Ga., assignors to Oxford Industries, Inc., Vidalia, Ga.

Division of Ser. No. 945,214, Sep. 25, 1978, Pat. No. 4,223,815. This application Jul. 3, 1980, Ser. No. 165,747

Int. Cl.³ A41D *27/18;* **A41H** *37/00, 43/00*

U.S. Cl. 223—002 **5 Claims**

1. A method of forming collar stays and inserting collar stays into partially completed shirt collars having at least two outer plies of material forming a pair of generally triangular stay-receiving pointed portions, comprising the steps of moving a length of continuous collar stay material along its length from a supply along a path, and while in the path the steps of cutting the material into collar stay segments, applying a spot of adhesive to a predetermined portion of each of the segments, moving alternate ones of the segments to a position adjacent one portion of a collar template having a pair of pointed end portions and moving the other alternate ones of the segments to a position adjacent the other portion of the collar template, moving the segments along the surface of the template with the adhesive facing away from the template until the segments each overlie the pointed end portions of the template, placing the stay-receiving pointed portions of the collar over the pointed end portions of the template, pressing the collar against the adhesive on the segments to cause the segments to adhere to the collar, and removing the collar with its segments from the template.

4,478,360

PRESS FEEDER

Stephen Patkos, R.R. #1, Campbellville, Ontario, Canada L0P 1B0

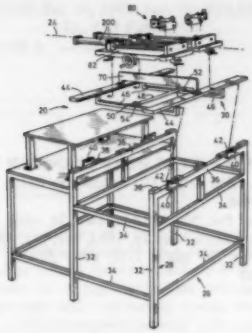
Filed Aug. 19, 1982, Ser. No. 409,691

Int. Cl.³ B65H *17/36*

U.S. Cl. 225—163 **26 Claims**

11. A feeder having a carriage mounted for reciprocal movement along an axis to move material along the axis, and a clamp moveable with said carriage and comprising a pair of clamp

members each having a jaw mounted thereon and being moveable relative to one another to move said jaws into gripping engagement with said material, an actuator acting between said clamping members to transmit forces directly therebetween and motor means operable on said actuator to cause displacement of said actuator and induce relative movement between said clamping members, whereby forces generated by said jaws gripping said material are transmitted between said clamping members through said actuator to minimise forces acting on said motor means.



4,478,361

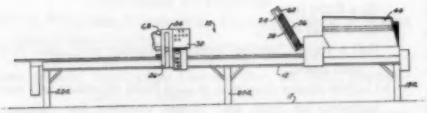
AUTOMATIC NAILING APPARATUS

Gordon W. McElhannon, P.O. Box 309, Foreman, Ark. 71836

Filed Mar. 11, 1982, Ser. No. 357,052

Int. Cl.³ B27F *7/02;* **B23P** *19/00*

U.S. Cl. 227—7 **11 Claims**



1. An automatic nailing apparatus for nailing transverse board slats to spaced parallel board stringers, comprising:

an elongated frame having parallel, longitudinally-extending guide means for directing stringers along spaced-apart parallel paths;

a transversely-extending member elevated above said frame;

a stringer magazine mounted on said frame adjacent each of said guide means, for holding in a vertical stack a plurality of board stringers;

means for ejecting from each stringer magazine a lowermost one of a vertical stack of stringers therein, to place a stringer in each of said guide means;

a slat magazine mounted on said frame, for holding in a vertical stock a plurality of board slats;

means for ejecting from said slat magazine a lowermost one of a vertical stock therein, to place a transversely-extending slat onto a plurality of stringers located in said guide means;

a conveyor carried in said frame, for continuously advancing as a unit a transversely-extending slat and a plurality of underlying stringers;

nailing means mounted on said transverse member, for automatically nailing a transversely-extending slat to each of said stringers; and

nailing control means for sensing that a slat is in position beneath said nailing means, and actuating said nailing means, thereby driving a nail through the slat into each of the underlying stringers as the same are continuously moved by said conveyor.

4,478,362

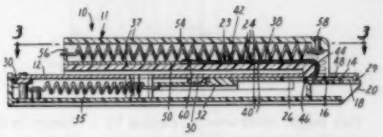
STAPLER CARTRIDGE WITH ANGULARLY DISPOSED STAPLE GUIDE TRACK PORTIONS

Floyd L. Foslien, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 7, 1980, Ser. No. 147,480

Int. Cl.³ B25C *5/08, 5/11;* **A61B** *17/04*

U.S. Cl. 227—19 **15 Claims**



1. A stapler cartridge comprising:

a plurality of generally U-shaped staples each having a central portion and a leg projecting from each end of said central portion;

means for defining a track having an end and comprising surfaces spaced to guide opposite sides of the central portion of said staples along said track and restrict relative displacement of the central portions of said staples transverse of said track, said track comprising portions disposed with respect to each other at an included angle of less than 180 degrees and an arcuate portion between said portions which is arcuate about an axis parallel to said surfaces, and having said staples disposed along its length with their legs projecting generally normally away from said track on the side opposite said included angle with the staples along said arcuate portion being disposed with their legs projecting generally normally away from the axis of said arcuate portion; and

means for biasing the central portions of said staples along said track toward said end comprising a flexible follower plate having a width and thickness similar to the width and thickness of the central portions of said staples, having one end in contact with one of said staples and being flexible about an axis transverse of its width to allow it to move around said arcuate portion to press said staples toward said end.

4,478,363

METHOD OF PRODUCTION OF COMPOSITE BILLET FOR FUEL CLADDING TUBE

Hiromichi Imahashi; Shigeo Turuoka; Keiichi Kuniya, all of Hitachi; Tomio Iizuka, and Akira Kawahara, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1981, Ser. No. 254,297

Claims priority, application Japan, Apr. 15, 1980, 55-50747; Apr. 15, 1980, 55-50748

Int. Cl.³ B21D *39/04*

U.S. Cl. 228—131 **9 Claims**

1. A method of producing a composite billet for a nuclear fuel cladding tube, comprising the steps of:

preparing a hollow outer billet of a nuclear fuel cladding material and a hollow inner billet of an outer diameter smaller than the inner diameter of the hollow outer billet;

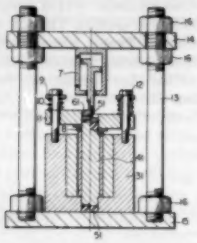
inserting the hollow inner billet in the hollow outer billet;

inserting in the hollow inner billet a resilient member longer than the inner billet and disposed so that the end portions of said resilient member are protruded axially outwardly from both ends of the inner billet;

inserting said outer and inner billets and said resilient member into a die; and

applying a pressure to the resilient member in the axial

direction of the billets to force the inner billet against the outer billet to form a pressure bonding between an inner surface of the outer billet and an outer surface of the inner billet while preventing the resilient member from leaking



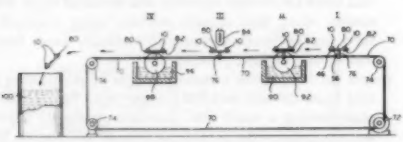
that might otherwise be caused by a change in the axial length of the inner billet, whereby a uniform bonding can be obtained through the entire interface between said inner and outer billets.

4,478,364

METHOD OF MOUNTING AND CLEANING ELECTRICAL SLIDE SWITCH OF FLUSH THROUGH DESIGN

Albert F. Ditzig, Hoffman Estates, Ill., assignor to RE-AL, Inc., Wheeling, Ill.

Division of Ser. No. 205,584, Nov. 7, 1980, Pat. No. 4,366,351.
This application Aug. 3, 1982, Ser. No. 404,771
Int. Cl.³ B23K *35/24*
U.S. Cl. 228—201 **2 Claims**



1. A method for mounting an electrical slide switch on a printed circuit board having apertures formed therein by means of a wave soldering process, said electrical slide switch having a housing with a pair of electrical leads with overlying contact areas positioned therein, said electrical leads having a leg portion protruding beneath said housing to form electrical terminals corresponding to said circuit board apertures, and a pair of spaced side supports supporting the slide actuator of said switch, said side supports having an open area communicating with the contact areas of said electrical leads and extending through said housing, said method comprising:

positioning the electrical terminals of the slide switch in the corresponding apertures of the circuit board so that said terminals will protrude beyond the foil side of said circuit board;

passing said protruding terminals and foil side of said circuit board through a means for preparing said terminals and foil for soldering;

bringing said terminals and foil into contact with a flow solder wave thereby depositing solder between said terminals and their surrounding foil areas;

cooling said solder so as to establish an electrical connection between said terminals and their surrounding foil areas and fix said switch on said circuit board;

cleaning said switch and circuit board by passing a solvent over said switch and circuit board, through the open areas of said switch side supports and between the contact areas of said electrical leads;

inserting a protective material between said electrical lead contact areas prior to passing said circuit board through the soldering preparing means; and

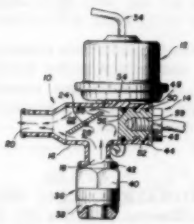
removing said protective material through the open areas formed in said switch housing after cleaning said switch and circuit board.

4,478,365

WATER VALVE WITH HEAT TRANSFER SOCKET

Kirk B. Peloza, Glen Ellyn, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 219,644, Dec. 24, 1980, abandoned.
This application May 18, 1983, Ser. No. 494,694
Int. Cl.³ B60H *1/00*; F28F *27/00*
U.S. Cl. 236—38 **7 Claims**



1. A fluid valve, said valve comprising:

(a) plastic housing means, said housing means including structure defining,

(i) a fluid inlet,

(ii) a fluid outlet,

(iii) a fluid chamber communicating with said inlet and said outlet,

(b) valve means disposed in said fluid chamber and movable between an open and closed position for valving fluid flow to said outlet in response to a varying condition

(c) socket means formed of metal and received in an opening in the wall of said chamber, said socket means including;

(i) structure defining a heat accepting surface portion in contact with fluid flowing through said fluid chamber, said socket means defining a bore having heat transmitting surfaces therein,

(ii) an annular recess having received therein a portion of the plastic material of said housing for preventing removal of said socket means;

(iii) locking surface means engaging said chamber wall and operable for preventing rotation of said socket means in said opening with respect to said wall;

(d) seal means operable to prevent fluid passage between said socket means and said housing means;

(e) temperature sensing means disposed at least partially in said bore and operatively receiving heat from said heat transmitting surfaces, said temperature sensing means being adapted for electrical connection to means for selective control thereo; and

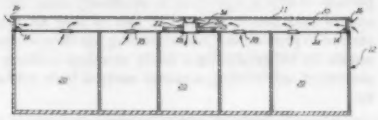
(f) said valve means including a valve member spaced closely adjacent said heat accepting surface portion, said valve member including a fluid deflecting surface portion operable when said valve means is in said open position to deflect a portion of the flow through said chamber to create a vortex for effecting rapid heat transfer between the fluid and said socket means.

4,478,366

VENTILATION SYSTEM FOR REDUCING THE HUMIDITY IN AN ATTIC OR ROOF CAVITY SPACE

Donald L. Coddens, 60189 Fellows St., South Bend, Ind. 46614, and Paul D. Van Belle, 1507 South 13th St., Niles, Mich. 49120

Filed Jul. 14, 1983, Ser. No. 513,626
Int. Cl.³ F24F 3/14
U.S. Cl. 236—44 A 3 Claims



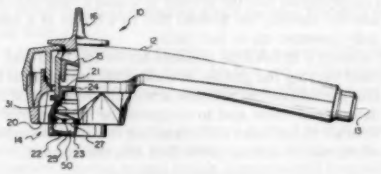
1. A ventilation system in a home including living quarters and roof cavity space separated by a ceiling, said ventilation system including a vent between said roof cavity space and ambient outside air, a register in said ceiling between said living quarters and said roof cavity space, the improvement wherein the ventilation system includes a fan unit, said fan unit having a housing, said housing mounted in said ceiling in communication between said roof cavity space and said living quarters and including a motor operated fan mounted within said housing and humidity detecting switch means for activating the fan when the humidity level in said roof cavity space reaches a predetermined point and deactivating the fan when the humidity level reaches a lower predetermined point, said fan constituting means for drawing outside air into said roof cavity space through said vent and drawing air from said living quarters into said roof cavity space through said register whereby said outside and living quarters air is mixed and expelled into said living quarters.

4,478,367

SHOWER PULSATOR

Sigurdur G. Petursson, Mississauga, Canada, assignor to Waltec Inc., Cambridge, Canada

Filed Sep. 23, 1982, Ser. No. 422,028
Claims priority, application Canada, Dec. 10, 1981, 391946
Int. Cl.³ B05B 1/08, 3/16
U.S. Cl. 239—381 8 Claims



1. A pulsating spray head for attachment to a source of fluid under pressure, comprising:

a housing having an inlet and an outlet,

a hollow annular body portion mounted in said housing and also having an inlet and an outlet,

a flat primary plate having a plurality of perforations arranged in radially extending rows and which closes the outlet of said body portion,

a pulse disc being retained within said body portion and having a conical face resting on said primary plate, fluid flow through said body portion causing said conical face of said disc to roll around on said primary plate and sequentially block the perforations in the primary plate whereby pressure fluctuations are caused in fluid exiting the head via the perforations in the primary plate, and

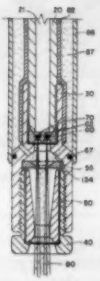
an orifice plate being secured in spaced relation to said primary plate whereby at least one pressure chamber is formed between said primary plate and said orifice plate, rolling of said disc causing pressure fluctuations to be superimposed on a base pressure within each chamber.

4,478,368

HIGH VELOCITY PARTICULATE CONTAINING FLUID JET APPARATUS AND PROCESS

Gene G. Yie, Auburn, Wash., assignor to Fluidyne Corporation, Auburn, Wash.

Filed Jun. 11, 1982, Ser. No. 387,437
Int. Cl.³ B05B 7/14; B24C 5/04
U.S. Cl. 239—430 23 Claims



1. A nozzle apparatus for producing a fluid jet stream comprising solid particulates, said apparatus comprising: a central pressurized fluid chamber capable of withstanding a pressure between about 10,000 to about 60,000 psi; pressurized fluid supply means capable of supplying fluid at a pressure between about 10,000 to about 60,000 psi and fluid inlet means to one end of said pressurized fluid chamber; fluid orifice means having a plurality of outlets forming at the other end of said chamber pressurized multiple fluid streams symmetrical to a central axis and the central portion of said multiple fluid streams having a volume of reduced pressure; solids particulate supply means and solids inlet means comprising multiple orifices positioned at an angle to said central axis and peripheral to said fluid orifice means providing said solids passing through said solids inlet means movement at an angle to and in the direction of and mixing with said multiple fluid streams forming said fluid jet; and a flow shaping nozzle having a tapered converging through passage shaped and positioned for said fluid jet stream comprising solid particulates to pass through the throat of said flow shaping nozzle, said throat being substantially at the periphery of said fluid jet stream comprising solid particulates.

4,478,369

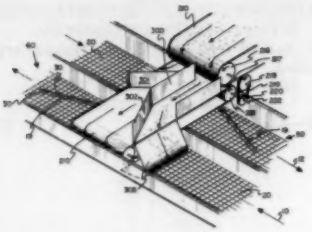
APPARATUS FOR SPREADING GRANULAR MATERIAL

Hubert B. Von Holten, Lafayette, Ind., assignor to Hawk Eye, Inc., Lafayette, Ind.

Filed Feb. 1, 1983. Ser. No. 462,884
Int. Cl.³ A01C 15/00
U.S. Cl. 239—664 6 Claims

5. A material distributing apparatus including a wheeled receptacle for said material having a rearwardly directed outlet, a pair of material dispensing troughs, said troughs extending laterally of said vehicle body and in opposite directions from beneath said discharge chute, with overlapping inner ends, pivoted connections between said vehicle body and said troughs for the upward and inward swinging of said troughs into positions of non-use, said troughs being of open frame construction, an endless sprocket chain operatively mounted lengthwise and within each trough, a pair of triangular trough bottom portions, with their bases at opposite ends of the trough and sized to have a slot therebetween, said portions being

within the confines of each trough directly beneath the bottom run of said chain therein, said chain being operated so that the bottom run is conveyed from a point at about the centerline of said vehicle body to a point at about the outer end of said



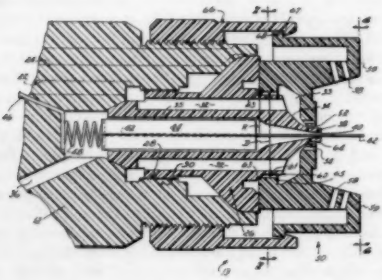
trough whereby material dropping onto the conveyor chain is moved outward as said material falls through said slot in a substantially uniform manner from about the centerline of said vehicle body to a point at about the outer extremity of each of said troughs.

4,478,370

AIR ATOMIZING NOZZLE ASSEMBLY

Donald R. Hastings, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Mar. 19, 1982, Ser. No. 360,103
Int. Cl.³ B05B 5/02
U.S. Cl. 239—707 **20 Claims**



1. In a system for the coating of articles with a liquid coating material supplied from a pressurized bulk coating source wherein said liquid coating material is emitted from a coating material spray device in the form of an atomized spray produced by impacting a central stream of liquid coating material under pressure with a pressurized gas stream encircling said central liquid stream and wherein the articles to be coated are spaced from said spray device, the combination comprising:

a source of liquid coating material under pressure;

a source of pressurized atomizing gas;

a material spray device having a liquid conduit with flow control means therein adapted to be connected to said source of pressurized liquid coating material, and having a gas conduit therein adapted to be connected to said source of pressurized atomizing gas; and

a spray coating nozzle assembly which is substantially constructed of nonconductive plastic material comprising

a nozzle connected at its rear end to said spray device and having a flow passage communicating with said liquid conduit, said nozzle having a nozzle tip through which said liquid coating material is emitted in a central stream,

an air cap communicating with said atomizing gas conduit through which gas is ejected for impinging and atomizing said central stream of liquid coating material emitted from said nozzle tip of said nozzle,

said atomizing gas being emitted from a uniformly dimensioned annular orifice surrounding said nozzle tip and defined by the exterior surface of said nozzle tip and an interior bore surface of said air cap,

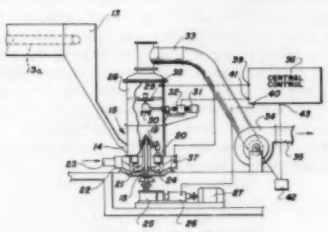
said air cap being supported by said spray device and being positionably located relative to said nozzle by interference press-fit engagement of an internal cylindrical diameter portion of said air cap with a mating outside diameter portion of said nozzle as as to positively align the center axis of said nozzle tip on the axis of said air cap bore surface to provide uniform atomizing gas flow around said nozzle tip for producing a finely atomized uniform spray pattern of said coating material emitted from said nozzle tip.

4,478,371

FUEL GRINDING APPARATUS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Jan. 7, 1982, Ser. No. 337,586
Int. Cl.³ B02C 23/24
U.S. Cl. 241—18 **3 Claims**



1. A method of operating a fuel grinding apparatus independently of the rate at which fuel arrives at the grinding apparatus which includes:

(a) feeding the fuel into a grinder and a classifier;

(b) classifying the fuel to a substantially uniform particle size;

(c) supplying air into the grinder to create a fluid bed of fuel, and for moving the ground fuel to a boiler at a substantially constant air to fuel ratio;

(d) sensing a differential pressure across the fluid bed;

(e) and varying the grinder and classifier at speeds to maintain the differential pressure across the fluid bed at a predetermined value and to maintain the substantially constant air to fuel ratio while grinding the fuel independently of the rate of arrival of the fuel into the grinder.

4,478,372

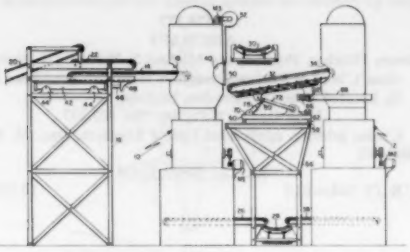
BYPASS FEED APPARATUS

Malcolm M. Paterson, Lee, N.H., and Dennis H. Plowell, Lowell, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 15, 1979, Ser. No. 20,556
Int. Cl.³ B02C 25/00
U.S. Cl. 241—35 **22 Claims**

1. A material handling system comprising first and second processing devices, first feeder material transporting means for normally moving material thereon from a first source to said first device, second feeder material transporting means for normally moving material thereon from a second source to said second device, detection means for detecting when one of said devices is inoperative, and operative means operable in response to said detection means for automatically moving the first feeder material transporting means to a position where material thereon is moved to the second device when said first

device is inoperative and for moving the second feeder material transporting means to a position where material thereon is



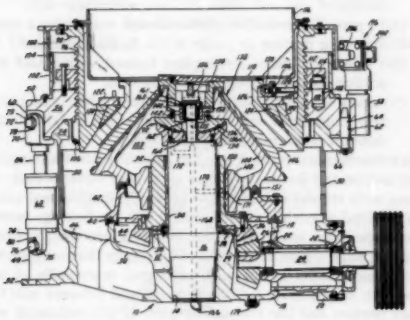
moved to the first device when said second device is inoperative.

4,478,373

CONICAL CRUSHER

John A. Gieschen, West Allis, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Oct. 14, 1980, Ser. No. 196,509
Int. Cl.³ B02C 2/04
U.S. Cl. 241—208 27 Claims



1. An apparatus for crushing materials, comprising:

(a) a frame structure including a hub member having a vertical bore;

(b) a stationary support member having a central longitudinal axis, and having an upper portion and a lower portion, said lower portion being positioned within said bore and secured to said hub;

(c) a cylindrical eccentric mounted around said stationary support member for eccentric rotation therearound, said eccentric having an axis which intersects said longitudinal axis;

(d) means for rotating said eccentric about said support member;

(e) a head assembly having a cylindrical eccentric follower mounted on said eccentric for eccentric rotational movement about said support member, and including a lower crusher surface, and an upper spherical bearing member fixed to the underside of said head assembly;

(f) a bowl assembly mounted for adjustable movement relative to said frame, said bowl assembly having an upper crusher surface spaced an adjustable predetermined distance from said lower surface under static conditions; and

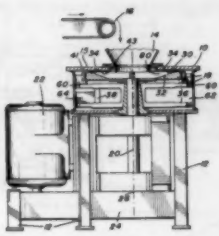
(g) a spherical bearing seat supported by rigidly fixed to said upper portion of said support member, and holding and supporting said upper spherical bearing member, said spherical bearing seat having a center of curvature which substantially coincides with said intersection of said eccentric axis and said longitudinal axis.

4,478,374

CHIP THICKNESS SEPARATOR

Joseph A. Lapointe, deceased, late of Pointe Claire, Canada, and by June Lapointe, executrix, 233 Springdale Ave., Pointe Claire, Canada

Filed Mar. 23, 1982, Ser. No. 360,827
Int. Cl.³ B02C 7/08
U.S. Cl. 241—261.2 9 Claims



1. A device for separating discrete pieces of material having a thickness defined by the spacing between two major surfaces such as wood chips by thickness comprising, a housing, a disc rotatable on an axis of rotation in said housing; an axial inlet to said disc through said housing, means to feed said material through said inlet, a face of said disc cooperating with an operating face on said housing to define a passage between said housing and said disc, said passage terminating in an annular outlet adjacent to periphery of said disc, said outlet having a height determining maximum thickness of material that may pass therethrough, orienting bars on said face of said disc facing said inlet and extending from said axis, of rotation radially outward beyond said inlet by a distance sufficient to accelerate material entering adjacent the outer periphery of said inlet to a radial velocity leaving said bars approaching the radial velocity leaving said bars of material entering adjacent said axis, a fustro conical orienting surface extending radially outward from the radial extremities of said orienting bars by a distance sufficient to permit said material to be oriented with one of said major surfaces against said orienting surface and in a position to intercept material moving radially from said orienting bars, said orienting surface and the operating face of said housing defining a tapering portion of said passage narrowing towards said outlet.

4,478,375

CONVEYING DEVICE FOR CONTINUOUS THREADS

Alberto G. Sarfati, Busto Arsizio; Massimiliano Bianchi, Milan, and Merate Riva, Pagnana di Merate, all of Italy, assignors to Sobrevin Société de brevets industriels-Etablissment, Vaduz, Liechtenstein

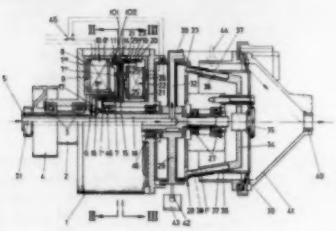
Filed Jul. 27, 1981, Ser. No. 287,329
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031260
Int. Cl.³ B65H 51/20
U.S. Cl. 242—47.01 11 Claims

1. In a conveying device for continuous threads comprising an accumulator receiving several thread windings, the thread running tangentially to the accumulator and the thread being removed therefrom in the axial direction and a regulation device coordinated to the accumulator for regulating the thread feed from time to time only until reaching a certain number of thread windings on the accumulator, the regulation device comprising a sensing device sensing the thread windings on the accumulator, a brake mechanism for stopping the thread feed, a continuously running drive, a power take-off

axle carrying a thread winding part adapted to cooperate with the accumulator, and a coupling mechanism connecting or disconnecting said continuously running drive to or from, respectively, said power take-off axle, the improvement comprising

a two-part housing,

the coupling mechanism comprising an annular magnet arranged fixed in position concentrically to an axis of the accumulator, the annular magnet having a winding connected to a voltage source and to the sensing device for operating the coupling mechanism, and wherein the two-



part housing encloses the annular magnet for concentrating magnetic field lines of the magnet,

said two-part housing including a rotating housing part and a stationary housing part, said rotating housing part being rotatably mounted and connected permanently with the continuously running drive and forming a slot with respect to the stationary housing part, the width of the slot peripherally varying in uniform distribution, and

a first ring made of electrically conducting material projecting into the slot, the ring being jointly rotatably connected with the power take-off axle.

4,478,376

METHOD OF WINDING MAGNETIC RECORDING TAPE

Masaaki Sakaguchi; Shinichi Satoh; Seiji Kiuchi, and Hiroshi Chikamasa, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

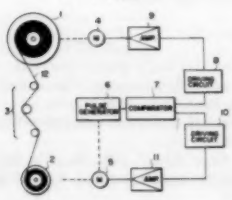
Filed Dec. 29, 1982, Ser. No. 454,273

Claims priority, application Japan, Jan. 13, 1982, 57-3972

Int. Cl.³ B65H *59/38*; G03B *1/02*; G11B *15/13*

U.S. Cl. 242—191 **3 Claims**

FIG.I



1. A method of winding a predetermined length of tape fed out from a first winding frame onto a second winding frame in which the running speed of the tape is changed in at least two steps, comprising the steps of: generating, concurrently with the beginning of each winding cycle, a train of pulses, the number of which is proportional to the number of rotations of one of the winding frames, and changing the running speed of the tape when the number of pulses in the pulse train reaches a predetermined value corresponding to the time period during which a predetermined length of the tape is wound up onto the second winding frame and at the end of which the running speed of the tape is to be changed.

4,478,377

AIRCRAFT

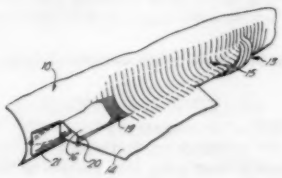
James Fletcher, Preston, and Michael S. Wooding, Lytham St. Anne's, both of England, assignors to British Aerospace Public Limited Company, London, England

Filed Dec. 9, 1981, Ser. No. 329,137

Claims priority, application United Kingdom, Dec. 22, 1980, 8041042

Int. Cl.³ B64D *33/04*

U.S. Cl. 244—12.5 **10 Claims**



1. An aircraft having

(i) a central fuselage portion

(ii) a pair of wing portions projecting one from each side thereof

(iii) a pair of intermediate portions each connecting a respective wing portion to a side of the fuselage portion

(iv) a jet propulsion powerplant housed within said body portion for generating propulsion fluid

(v) a pair of jet propulsion outlet means for receiving propulsion fluid from said powerplant and for exhausting it through respective outlet apertures,

each intermediate portion being of generally aerofoil longitudinal section and formed of upper and lower surfaces each concave with respect to respective generally longitudinal axes so as to blend smoothly with the wing and the fuselage portion, the upper and lower surfaces diverging rearwardly from a leading edge region to a region of maximum thickness, each jet propulsion outlet means being arranged rearwardly of a respective intermediate portion adjacent and between said fuselage portion and the rearward region of the associated wing portion and being shaped to lie substantially within a rearward projection of the region of maximum thickness of the intermediate region.

4,478,378

AIRCRAFT WITH JET PROPULSION

Alfredo Capuani, Torino, Italy, assignor to Aeritalia-Societa Aerospaziale Italiana-per Azioni, Turin, Italy

Filed Oct. 12, 1982, Ser. No. 434,073

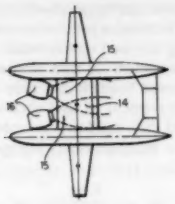
Claims priority, application Italy, Oct. 15, 1981, 68334 A/81; Mar. 30, 1982, 67415 A/82

Int. Cl.³ B64C *21/04*; B64D *27/18*

U.S. Cl. 244—12.5 **13 Claims**

1. An aircraft having a wing and jet propulsion means for directing jets over the top surface of the wing to provide additional lift as a result of the supercirculation over the wing wherein said jets have a flattened and widened configuration above the top surface of the wing comprising nozzles on said jet propulsion means from which the jets emerge being located substantially in longitudinal correspondence with the leading edge of the wing and being vertically spaced above said wing and two longitudinal surfaces projecting from said top surface of the wing and being spaced from each other by a distance substantially corresponding to the width of said jets over the wing to define a single active surface portion of said top surface of said wing and to form a single surface ejector system having a primary fluid consisting of the jets and a secondary

fluid consisting of the relative air flow over said active surface of the wing, wherein successive zones of expansion, mixing, and recompression of said ejector system are defined by said



single active surface and said jets are directed closely adjacent to the trailing edge of the wing so that the jets are deflected downwardly immediately downstream of the wing by virtue of the Coanda effect.

4,478,379

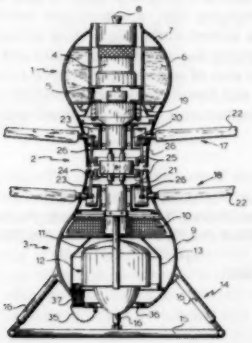
UNMANNED REMOTELY PILOTED AIRCRAFT

John P. Kerr, Hudson Heights, Canada, assignor to Canadair Limited, Montreal, Canada

Continuation of Ser. No. 267,865, May 28, 1981, abandoned. This application Oct. 27, 1983, Ser. No. 545,609

Int. Cl.³ B64C *27/10*

U.S. Cl. 244—17.11 **6 Claims**



1. An unmanned, remotely piloted aircraft comprising:

a main body symmetrical about a vertical axis comprising three separable, vertically stacked body sections;

the uppermost one of said body sections including means to enclose and support a propulsive engine;

a propulsive engine contained within and supported by said uppermost body section;

a fuel tank in said uppermost body section arranged to laterally surround at least a major portion of said engine;

the intermediate one of said body sections including means to support a gear box connectable with said engine, a pair of vertically arranged counterrotating propeller hubs and propeller blades secured thereto, and pitch control means for the propeller blades;

a centrally located gear box enclosed within said intermediate one of said body sections and supported by said means to enclose and support said gear box;

a pair of vertically spaced counterrotating propeller hubs connected together for being jointly driven by said engine through said gear box enclosed within and supported by the intermediate body section;

variable pitch propeller blades secured to said hub through a rigid connection arranged to permit the pitch of the propellers to be changed;

pitch control means enclosed by and supported by said intermediate body section connected to the propeller blades and arranged to control the pitch of all the propeller blades simultaneously in a collective and/or differential sense;

the lowermost one of said body sections including means for containing and supporting a payload of known mass;

a payload of known mass contained within and supported by said lowermost body section;

said propeller hubs located substantially in the horizontal plane including the center of mass of the aircraft with said payload.

4,478,380

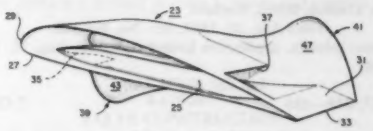
WING TIP VORTICES SUPPRESSOR

James F. Frakes, P.O. Box 1025, Keene, Tex. 76059

Filed Dec. 3, 1982, Ser. No. 446,456

Int. Cl.³ B64C *21/02, 23/00*

U.S. Cl. 244—199 **4 Claims**



1. A wing tip vortices suppressor which comprises:

a scoop passing through the wing, with an inlet and an outlet located near the wing tip;

the inlet being located in the lower surface of the wing, adjacent the leading edge, to entrain high pressure air during flight;

the outlet being located in the upper surface of the wing, adjacent the trailing edge, to discharge air from the inlet;

a wing tip fence positioned outboard said inlet and outlet;

the fence and the scoop cooperating to suppress the vortices and reduce the pressure differential at the trailing edge of the wing tip.

4,478,381

PIPE CLAMP

Philippe Pittion, Sassenage; Guy Andre, Seyssinet-Pariset; Gerald Souillard, Seyssinet-Pariset; Jean-Louis J'espere, Seyssinet-Pariset, and Bernard Houte, Eybens, all of France, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,490

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126488

Int. Cl.³ F16L *3/24*

U.S. Cl. 248—71 **2 Claims**

1. An elastic clamp for a pipe or the like comprising: a lower yoke, means for anchoring the lower yoke to a fixed surface, a cooperating upper yoke, the pipe being securely held between the yokes when the yokes are locked together in a positive manner, a hinge-band pivotally connecting one end of the upper yoke to one end of the lower yoke, mutually engaging

locking hooks on the opposite ends of the yokes from the hinge-band for locking the yokes together, at least two arcuate beaks on the hinged end of one of the yokes that curve inwardly with respect to and over the hinge-band, the beaks being adjacent to the outer edges of the one yoke leaving a recess therebetween, the surface of the arcs of the outer edges of the beaks being a continuation of the surface of the inside wall of the one yoke, cooperating recesses for the beaks in the other yoke being open on their outer sides and having upper and lower walls with a radius of curvature similar to the curvature of the beaks, the beaks substantially filling the cooperating recesses when the clamp is closed, the beaks being located on the upper yoke of the clamp and the cooperating recesses being located in the lower yoke clamp, and locking catches on the outer ends of the beaks, and cooperating catch surfaces at the opposite ends of the cooperating recesses from the ends through which the beaks are inserted, the catches of the beaks engaging the catch surfaces simultaneously with engagement of the locking hooks when the clamp is closed.

4,478,382

PIVOTAL MOUNTING SYSTEM

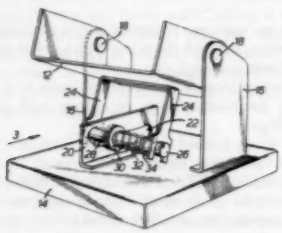
John A. Carrier, Chilwell, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 20, 1982, Ser. No. 409,829

Claims priority, application United Kingdom, Aug. 21, 1981, 8125681

Int. Cl.³ F16M *11/10*

U.S. Cl. 248—185 **7 Claims**



1. A mounting system for a relatively heavy article, said system comprising:

a base member, pivot means and a mounting member, said mounting member being pivoted by said pivot means on said base member, said pivot means being located substantially in alignment with the centre of gravity of an article to be received on said mounting member, a bracket formed on said base member in a position remote from said pivot means and defining a slot, a lever, extending from said mounting member such that its end is adjacent to said bracket and engages said slots formed in said bracket, said bracket friction means located between said end of said lever and said slot whereby said mounting member can pivot on said pivot means and is retained in a predetermined position by said friction means.

4,478,383

SEAT FRAME WITH AN INTEGRALLY BUILT-IN SLIDE RAIL MECHANISM

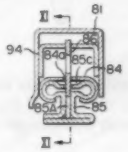
Muneharu Urai, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,911

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—429 **2 Claims**

1. A seat frame with an integrally built-in slide-rail mechanism comprising a seat frame structure formed by integrally combining a seat-frame side member and a member corresponding to a slide-rail upper member to define an internal space of closed section therein, a stopper formed as an integral flat plate disposed in said internal space to extend through an elongate slot bored in said seat-frame side member and an aligned elongate slot bored in said slide-rail upper member, said stopper being formed with socket means in a substantially middle portion thereof and being also formed with a plurality of engaging lugs in its bottom portion, actuating means including means extending into said socket means of said stopper for causing vertical movement of said stopper, and a slide-rail lower member disposed beneath said slide-rail upper member to permit sliding movement of said slide-rail upper member relative thereto, said slide-rail lower member being formed of a single integral plate being generally I-shaped in cross-section,



both free ends of upper arms of the I-shaped plate being rounded so that the slide-rail upper member snugly engages the free ends without play for sliding movement and with a space being formed between the central area of the upper arms of the I-shaped plate and the slide-rail upper member for receiving a lubricant therein, and said slide-rail lower member being formed with slots in a central portion of said upper arms to receive said engaging lugs of said stopper member, whereby said stopper is moved vertically by said actuating means to move said engaging lugs of said stopper into and from engagement with said slots of said slide-rail lower member to releaseably lock said seat frame in any desired position and to permit longitudinal displacement of said seat frame when desired.

4,478,384

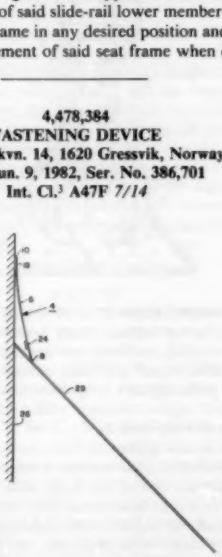
FASTENING DEVICE

Rolf Julseth, Bokfinkvn. 14, 1620 Gressvik, Norway

Filed Jun. 9, 1982, Ser. No. 386,701

Int. Cl.³ A47F *7/14*

U.S. Cl. 248—467 **9 Claims**



1. A fastening device for temporarily securing sheet material such as paper, cardboard or the like to a substantially rigid surface, comprising:

a sheet of resilient plastic material normally having a substantially planar configuration and having a tendency to return to said planar configuration upon release of a distorting force,

adhesive means, comprising an area of adhesive material on

one face of said sheet, for securing said sheet to a substantially rigid surface,

means, comprising a frictional pad secured to said face at a location spaced from said adhesive means, for clamping the sheet material to be held against said substantially rigid surface under the action of the resilience of said sheet of resilient plastic material.

4,478,385

CLIMBING FORMS

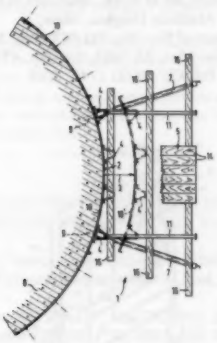
Josef Maier, Schwimmbadstr. 3, D-7611 Steinach, Fed. Rep. of Germany

Continuation of Ser. No. 373,532, Apr. 30, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,822

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117409

Int. Cl.³ E04B *11/22*

U.S. Cl. 249—20 **14 Claims**



1. Climbing forms for use in the erection of structures, such as concrete walls, having arcuate sides, comprising at least one platform; a frame supporting said platform and arranged to be separably supported by the structure which is being erected; a boarding disposed at a level above said platform and having a side at least substantially complementary to the arcuate side of the structure being erected; means for moving said boarding between an advanced position in which said side of the boarding is adjacent to the arcuate side of the structure being erected and a retracted position in which said side of the boarding and the arcuate side of such structure define an arcuate passage accessible to the occupants of the platform; and guide means for said moving means, said moving means being movable with said boarding relative to said guide means and relative to said platform between said advanced and retracted positions.

4,478,386

BAG FOR USE IN THE SHAPING OF LIQUID FOOD PRODUCTS OF STIMULANTS, AND A METHOD AND AN APPARATUS FOR USE IN THE PRODUCTION OF THE BAG

Henrik Mikkelsen, Naerum, Denmark, assignor to Jan Folkmar, Denmark

Filed Aug. 31, 1983, Ser. No. 528,158

Claims priority, application Denmark, Sep. 10, 1982, 4061/82

Int. Cl.³ B29C *1/00*; B29D *3/00*

U.S. Cl. 249—83 **6 Claims**

1. A bag for use in the shaping of liquid food products, the food products to be adhered to a plurality of sticks, comprising:

at least two layers of foil, which are partly joined to form a plurality of interconnected mould cavities with a common

inlet, said partly joined layers defining means for securing the sticks at a desired position in the mould cavities.

4,478,387

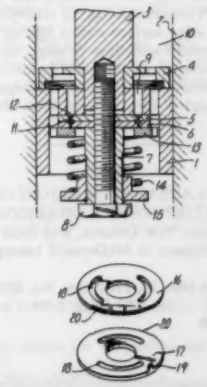
VALVE CONSTRUCTION

Pieter M. Postema, Oud-Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,725

Int. Cl.³ F16K *47/10*

U.S. Cl. 251—121 **1 Claim**



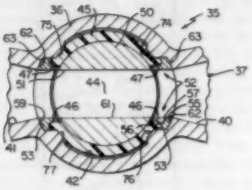
1. A valve construction for use in a hydraulic shock absorber including a piston provided with liquid passages debouching on a seat face and a valve operatively coupled to close the liquid passages, comprising two annular damping members arranged between the piston and the valve, each damping member being provided with a plurality of damping passages extending parallel to the axis of the valve construction, wherein the damping passages in the damping members are slot shaped, said slots extending over a part of a concentric circle, whereby adjustment of the damping characteristic occurs by relative rotation of both damping members and wherein each damping member is provided with an axially projecting cam co-extensive with its radially facing outer peripheral edge which engages a corresponding selected one of a plurality of recesses provided along the radially facing outer peripheral edge of the other damping member.

4,478,388

PLUG VALVE WITH REMOVABLE LIP INSERT MEANS

John A. George, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Nov. 1, 1982, Ser. No. 438,039
Int. Cl.³ F16K 5/02
U.S. Cl. 251—309 24 Claims



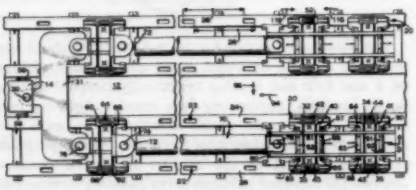
1. In a plug valve for controlling fluid flow therethrough, said valve having, an outer housing, a flow passage extending through said housing and including an inlet and an outlet interconnected by a bore disposed therebetween, said bore having a central axis disposed substantially perpendicular to said flow passage, a plastic sleeve disposed within said housing and lining said bore, said sleeve having a pair of aligned ports therein at diametrically opposed locations each defined by annular edge surface means, said ports being aligned with said inlet and outlet to enable fluid flow through said passage, a rotatable plug disposed within said sleeve, said plug having an opening therethrough which is adapted to be aligned in and out of registry with said inlet and outlet in accordance with rotation of said plug relative to said sleeve and housing, and means holding said sleeve against rotation relative to said housing, the improvement wherein said holding means comprises, removable lip insert means of roughly annular outline disposed against one of said edge surface means and against said housing, said lip insert means serving the multiple purpose of protecting said one edge surface means against impingement by fluid flowing through said flow passage, holding said sleeve against said rotation, preventing cold flow or extrusion of parts of said plastic sleeve in said flow passage, and providing smooth uninterrupted flow of said fluid through said flow passage.

4,478,389

JACKING APPARATUS ADJUSTABLE FOR ALIGNMENT VARIATIONS

Michael J. LeGlue, New Orleans, and Nico deBoer, Kenner, both of La., assignors to McDermott Incorporated, New Orleans, La.

Filed Dec. 17, 1981, Ser. No. 331,860
Int. Cl.³ B66F 1/04
U.S. Cl. 254—108 19 Claims



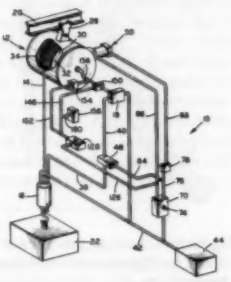
1. A jacking apparatus comprising means for generating force for application against at least two anchor points which are spaced apart in a transverse direction of the apparatus for movement of a load, force transmission means including at least two equalizing cylinders for transmitting the generated force through fluid in said equalizing cylinders to the anchor points, and means for limiting the fluid pressure in each of said equalizing cylinders to a predetermined value, said force transmission means further includes a frame for transmitting the force from said force generating means to said equalizing cylinders, at least two anchor point engagement means which are spaced apart in said transverse direction, at least one member movable relative to said frame in a longitudinal direction of the apparatus and having at least two portions spaced apart in said transverse direction to which said anchor point engagement means are respectively engaged, said member portions are movable relative to each other in said longitudinal direction, and said equalizing cylinders are attached to said frame and disposed to engage said respective member portions to transmit the force from said frame to said respective member portions for movement thereof in said longitudinal direction relative to said frame and to each other.

4,478,390

FLUID-OPERATED APPARATUS FOR HANDLING AND LIFTING LOADS

Dona C. Knight, Madison Heights; Robert J. Kish, Flint, and Albert D. Fox, Novi, all of Mich., assignors to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 351,943, Feb. 24, 1982,. This application Mar. 23, 1983, Ser. No. 477,927
Int. Cl.³ B66D 1/48, 1/08
U.S. Cl. 254—270 19 Claims



1. Load-handling apparatus comprising a fluid-operated hoist having a chamber and a piston, elongate means moved by said piston and extending from said hoist for urging a load in one direction when fluid pressure applied to the chamber exceeds a particular value and for being urged by the load in another direction when the pressure applied to the chamber is less than a particular valve, a pilot fluid-controlled regulator for applying fluid pressure to said chamber in response to pilot fluid pressure applied to said regulator, a load-responsive pilot fluid regulator for supplying pilot fluid to said pilot fluid-controlled regulator for increasing pressure of pilot fluid to said pilot fluid-controlled regulator when the load is heavier than a load that was previously carried by said elongate means and for decreasing the pressure of pilot fluid to said pilot fluid-controlled regulator when the load is lighter than a load that was previously carried by said elongate means, and a manually-operated, fluid-control valve for supplying fluid to said hoist chamber independently of said load-responsive pilot fluid regulator and said pilot fluid-controlled regulator.

4,478,391

FENCE PROTECTOR

Nickolas C. Kovach, 708 NW. 40th Ter., Kansas City, Mo. 64116

Filed Aug. 25, 1983, Ser. No. 526,484
Int. Cl.³ E04H 17/06
U.S. Cl. 256—1 3 Claims

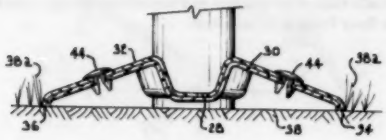
1. A device for use in conjunction with a fence, said fence

being of the type that extends substantially to the ground, said device comprising:

a plurality of polygonal sections adapted to be disposed in end to end relationship,

each of said sections presenting first and second inclined surfaces disposed in opposed intersecting planes,

said surfaces being separated by a trough portion extending the length of said section,



said trough portion being of generally u-shaped configuration and adapted to be placed between said fence and the ground, there being a plurality of holes along the bottom of the u,

one end of each of said sections presenting a tongue portion adapted to be placed beneath the opposite end of an adjacent section; and

means for holding said sections together while accomodating limited movement of the sections for thermal expansion and contraction.

4,478,392

METHOD FOR PREVENTING THE INCLUSION OF SLAG INTO THE MOLTEN STEEL TAPED FROM A CONVERTER

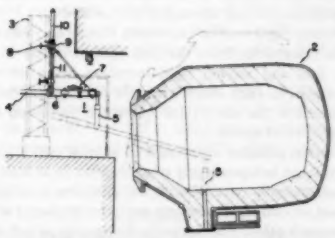
Koichiro Fuzii, Kure, Japan, assignor to Nisshin Steel Co., Ltd., Tokyo and Kurosaki Refractories Co., Ltd., Fukuoka, both of, Japan

Division of Ser. No. 278,117, Jun. 29, 1981, Pat. No. 4,431,169. This application May 24, 1982, Ser. No. 381,616

Claims priority, application Japan, Jul. 5, 1980, 55-92049; Jul. 10, 1980, 55-94634

Int. Cl.³ C21B *5/46*

U.S. Cl. 266—44 **10 Claims**



1. A method for preventing the inclusion of slag into molten steel tapped from a tap hole of a converter comprising the following steps:

(a) pivotally suspending an elongated stopper as a pendulum from a supporting arm,

(b) immersing said stopper in the molten steel in said converter,

(c) lowering said stopper temporarily to close said tap hole when the depth of said molten steel has reached a first level, utilizing said step of temporarily lowering said stopper to provide a frame of reference for determining how high to lift said stopper above said tap hole to achieve a first height,

(d) lifting said stopper to said first height above the inside opening of said tap hole in said converter,

(e) selecting said first height as the height which allows the molten slag to flow out of the tap hole while precluding the slag floating on the surface of the molten steel from being whirled into the molten steel flowing through the tap hole,

(f) maintaining said stopper in a generally vertical disposition irrespective of the tilted position of said converter,

(g) maintaining said stopper at said first height above the inside opening of said tap hole irrespective of the tilting of said converter,

(h) utilizing a spherically configured end portion on said stopper and thereby providing a first space between said stopper and the inside opening of said tap hole which first space is maintained constant irrespective of the tilted position of said converter,

(i) flowing a constant flow-out of said molten steel into said tap hole through said first space,

(j) preventing whirling of slag into the molten steel flow by maintaining said first space, and

(k) lowering said stopper when the molten slag is about to flow out through said tap hole upon completion of the tapping of the molten steel to prevent said molten slag from flowing out of the tap hole.

4,478,393

APPARATUS FOR THERMAL LONGITUDINAL PARTING OF RECTANGULAR METAL PLATE BARS, IN PARTICULAR OF CUT-TO-LENGTH CONTINUOUS-CASTING PLATE SLABS

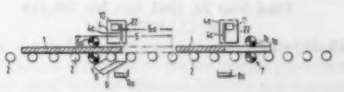
Gerhard Komma, Dinslaken, and Dietmar Lohse, Wesel, both of Fed. Rep. of Germany, assignors to Mannesmann Demag AG, Fed. Rep. of Germany

Division of Ser. No. 159,583, Jun. 16, 1980,. This application Oct. 7, 1983, Ser. No. 540,175

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1979, 2924365

Int. Cl.³ B23K *7/00*

U.S. Cl. 266—49 **13 Claims**



1. An apparatus for cutting a rectangular metal slab, which comprises

(a) a conveying means for supporting and conveying said metal slab,

(b) a thermal cutting machine mounted above said conveying means, and arranged to cut the metal slab being conveyed by said conveying means,

(c) carriage means associated with said cutting machine,

(d) said carriage means being arranged and configured to move said cutting machine in a direction transverse to the direction said metal slab is being conveyed,

(e) sensing means arranged to sense the locations of the outer edges of said metal slab,

(f) means to operate said carriage means in accordance with a predetermined relation to said sensed location of the outer edges, and

(g) a second thermal cutting machine mounted above said conveying means in a longitudinally spaced relation to said first cutting machine,

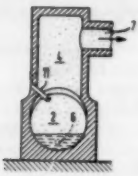
(h) each of said cutting machines being operable to partially cut said slab a predetermined length in the longitudinal direction.

4,478,394

APPARATUS FOR THE SEPARATION OF LEAD FROM A SULFIDIC CONCENTRATE

Olavi A. Aaltonen, Pori; Rolf E. Malmström, Helsinki; Esko O. Nermes, Turku, and Tapio K. Tuominen, Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Division of Ser. No. 254,211, Apr. 15, 1981, Pat. No. 4,391,632. This application May 16, 1983, Ser. No. 494,787
Claims priority, application Finland, Apr. 16, 1980, 801214
Int. Cl.³ F27B *3/16*
U.S. Cl. 266—162 **3 Claims**



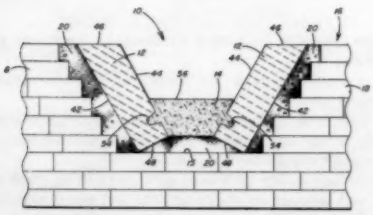
1. A flash smelting furnace for the separation of lead from a sulfidic concentrate, comprising a lower furnace having a substantially circular cross-section; a vertically oriented reaction shaft connected to the lower furnace at the lower end of the reaction shaft so that non-gaseous products of reaction in the reaction shaft settle on a floor of the lower furnace; means for feeding a finely-divided lead concentrate, a silicate-high slagging binding agent, and air or oxygen-enriched air into said reaction shaft to react therein; a rising shaft rising generally vertically from said lower furnace, said rising shaft being spaced and separated from said reaction shaft; means for discharging a melt from the lower furnace; means for removing gas via said rising shaft; and pipe means for feeding additional slagging binding agent into the lower furnace beneath the rising shaft.

4,478,395

REFRACTORY RUNNER

Harry R. Dudro, Jr., Pittsburgh, Pa., and Frank E. Morris, Portsmouth, Ohio, assignors to BMI, Inc., Pittsburgh, Pa.

Filed May 20, 1982, Ser. No. 380,216
Int. Cl.³ F27D *3/14*
U.S. Cl. 266—196 **11 Claims**



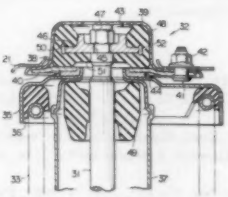
1. A refractory runner construction comprising,
a first side block and a second side block,
said first and second side blocks being fabricated of refractory material,
said first and second side blocks being positioned in substantially upstanding, spaced apart relation,
said first and second side blocks each having a lower edge portion,
a base extending between and abutting said lower edge portions of said first and second side blocks, said base being formed by a layer of particulate refractory material compacted to a preselected thickness to form a continuous, uninterrupted surface between said first and second side blocks,
means positioned at said lower edge portions of said first and second side blocks for receiving said particulate refractory material so that when said particulate refractory is compacted said first and second side blocks are interlocked, and
said first and second side blocks being interlocked by said base defining a trough having opposed upstanding side walls formed by said first and second side blocks joined by a floor formed by said base.

4,478,396

ELASTIC SUPPORT STRUCTURE OF WHEEL SUSPENSION MECHANISM

Takayoshi Kawaura, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 3, 1982, Ser. No. 404,868
Claims priority, application Japan, Oct. 9, 1981, 56-161759
Int. Cl.³ B60G *11/52*
U.S. Cl. 267—8 R **4 Claims**

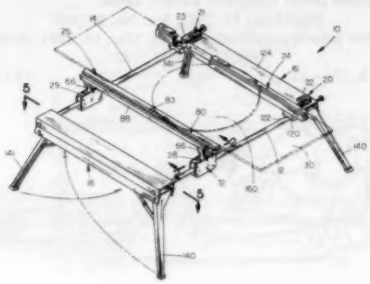


1. An elastic support structure for a wheel suspension mechanism of a wheeled vehicle having a body structure and a tire-and-wheel assembly suspended from the vehicle body structure by the wheel suspension mechanism, comprising
a first rigid member to be subjected to shocks and vibrations produced in the tire-and-wheel assembly,
a second rigid member to which shocks and vibrations may be transmitted from the first rigid member,
the first and second rigid members being movable with respect to each other when the first rigid member is subjected to the shocks and vibrations produced in the tire-and-wheel assembly,
an elastic member composed of at least two segments constructed independently of each other in at least one plane substantially parallel with the direction in which the first and second rigid members are to be displaced with respect to each other, said segments being contructed of the same material and being substantially similar in geometry, said elastic member consisting of first and second portions which are elastically deformable to different degrees, the first portion being elastically deformable when said first and second rigid members are forced to move toward each other and the second portion being elastically deformable when the first and second rigid members are forced to move away from each other, said first portion of the elastic member being less elastically deformable than the second portion of the elastic member, and
a third rigid member secured to said second rigid member and intervening between said first and second portions of said elastic member, the first and second portions of the elastic member being in part spaced apart from each other by and across said third rigid member and in part integral with each other around said third rigid member.

4,478,397
WORKPIECE SUPPORT STRUCTURE

William M. Krueger, 2027 N. 81st St., Omaha, Nebr. 68134

Filed Mar. 29, 1982, Ser. No. 362,760
Int. Cl.³ B25B 1/10
U.S. Cl. 269—170 26 Claims



1. A workpiece support structure, comprising,

a pair of elongated beams having forward and rearward ends,

first and second leg structures connected to said beams in longitudinally spaced-apart relation for supporting said beams in clearance relation above a support surface,

said first leg structure being positioned forwardly of said second leg structure, and each leg structure including an elongated frame means extended transversely between said beams,

first clamp means mounted on said first leg structure,

a first transversely extended guide member connected to said first clamp means for rearward movement toward said second leg structure in response to application of said first clamp means,

a second clamp means axially movably mounted on said beams, and

a second transversely extended guide member connected to said second clamp means for longitudinal movement therewith relative to said beams,

said second clamp means being releasably applicable to resist rearward movement whereby a workpiece engaged between said first and second guide members may be clamped therebetween upon application of said first clamp means, and

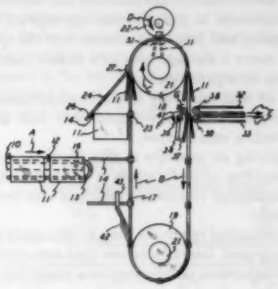
each leg structure including a pair of legs pivotally connected to said frame means for movement between storage positions generally parallel to said frame means and working positions extended downwardly from said frame means.

4,478,398
SYSTEM FOR ROUTING A SIGNATURE FOR STITCHING USING A LIFT FINGER

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Jul. 16, 1982, Ser. No. 398,980
Int. Cl.³ B42B 1/02
U.S. Cl. 270—53 6 Claims

1. A system for routing a signature for stitching, comprising a raceway for moving a signature with its folded sheets draped downwardly and with said raceway having a terminal end, a lift finger upwardly movably disposed adjacent said terminal end and having a length insertable between the folded sheets for lifting the signature upwardly by its fold, said lift finger being mounted on a support movable upwardly and horizontally, a rotary stitcher located in the horizontal path of movement of said support and said lift finger for receiving the signature and stitching same, and an engager disposed in the path of movement of the signature, when the signature has moved

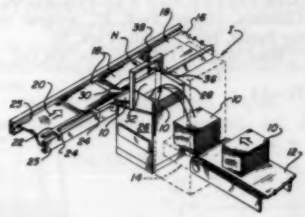


beyond said stitcher, for removing the signature from said lift finger.

4,478,399
INSERTING SYSTEM FOR NEWSPAPERS

George A. Morin, P.O. Box 826, Aurora, Colo. 80010, and Raymond H. Richardson, 66 Waverly Ave., Claredon Hills, Ill. 60514

Continuation of Ser. No. 185,236, Sep. 8, 1980, abandoned. This application Jul. 16, 1982, Ser. No. 399,011
Int. Cl.³ B65H 5/30
U.S. Cl. 270—55 12 Claims



1. An apparatus for feeding printed inserts sequentially into newspaper jackets as the jackets are fed along a predetermined path at high speed from an upstream location to a downstream location, said apparatus comprising:

a hopper at said upstream location for supplying said inserts and having a preadjusted, stationary gate providing an opening of a size through which the inserts sequentially may be fed only one at a time;

a high speed continuously movable endless perforated conveyor belt extending from within said hopper at said upstream location past said gate to a discharge point at said downstream location to selectively move inserts from said hopper and to said discharge point and into the newspaper jackets;

a pressure plenum mounted on a side of said belt opposite said hopper and just upstream of and immediately adjacent to said gate and having openings in communication with a first portion of said belt perforations;

means for supplying air under pressure to said pressure plenum to cause air to be blown through said first portion of belt perforations to hold the leading edge of the closest insert off of said belt at said gate to prevent feeding of the inserts;

a vacuum plenum mounted downstream of said pressure plenum and said gate and having openings in communication with said first portion of belt perforations and with a

second portion of said belt perforations downstream of said gate;

means for drawing a vacuum through said vacuum plenum to cause air drawn through said first and second portion of belt perforations to pull the leading edge of the closest insert against said belt to accelerate it to the speed of said belt and move it through said gate to said discharge point and into a newspaper jacket;

a plurality of first relatively short longitudinally extending channels spaced laterally below said belt and located entirely below said hopper;

means supplying air pressure to said first channels;

a longitudinal row of perforations in said belt each having an open area aligned to pass over each of said first channels, respectively;

a plurality of second relatively long longitudinally extending channels spaced laterally below said belt and extending from a point below said hopper to a point downstream of said hopper;

means drawing a vacuum through each of said second channels; and

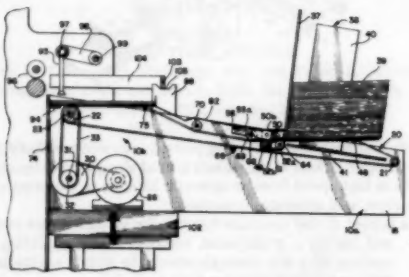
said belt perforations comprising a plurality of longitudinal valve slots in said belt aligned to pass over each of said second channels respectively for selectively applying a vacuum to the lowermost insert in said hopper each time said valve slots respectively pass over said second channels, said slots each having a length proportional to the time required to feed an insert and said slots each being spaced from each other in accordance with the desired feed rate of successive inserts.

4,478,400

ENVELOPE FEEDER FOR A DUPLICATING PRESS

Louis P. Commers, Melrose Park, Ill., assignor to Suburban Duplicator Repair, Inc., Franklin Park, Ill.

Filed May 19, 1982, Ser. No. 379,732
Int. Cl.³ B65H *5/22*
U.S. Cl. 271—3.1 **15 Claims**



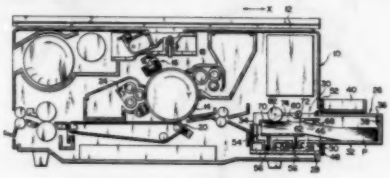
1. An envelope feeder for a duplicating press having a suction envelope feeder, said feeder comprising an input end where envelopes are stored in stacked relation and an output end where envelopes are stacked to be fed by the suction feeder into the press, a magazine at the input end for receiving a supply stack of envelopes and a magazine at the outlet end for storing a feed stack of envelopes in alignment with the suction feeder, a conveyer for removing envelopes from the bottom of the supply stack and conveying them to the feed stack and defining the bottoms for both of said magazines, said conveyer having an upwardly inclined path between the magazines such that the envelopes are fed to the bottom of the feed stack, metering means at the magazine at the input end for feeding one envelope at a time from the supply stack to the feed stack, and means at the output end magazine for detecting the height of the feed stack and stopping the conveyer when the stack has reached a first given height and starting the conveyer when the stack diminishes to a second given height.

4,478,401

APPARATUS FOR FEEDING SHEETS

Kunihiro Shibuya, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 11, 1982, Ser. No. 357,087
Claims priority, application Japan, Mar. 19, 1981, 56-40109
Int. Cl.³ B65H *3/32*
U.S. Cl. 271—22 **12 Claims**



1. An apparatus for feeding sheets, comprising:

a sheet storage box which stores and supports a stack of sheets, said stack of sheets being moveable between a feeding position and a non-feeding position in the sheet storage box;

housing means defining an insertion port through which the sheet storage box is inserted into the housing in an inserting direction which traverses a line extending from the feeding position to the non-feeding position, said storage box being removeably maintained in an inserted position at said insertion port;

biasing means provided in said sheet storage box, for biasing the stack of sheets in a direction from the non-feeding position toward the feeding position to bias the stack of sheets into the feeding position;

sheet feeding means provided in the housing, for engaging the uppermost sheet brought to the feeding position by said biasing means in order to feed the uppermost sheet in said sheet storage box to the housing, said sheet feeding means including at least one sheet feeding roller in a fixed position; and

isolating means for moving the stack of sheets from the feeding position to the non-feeding position in response to said sheet storage box being inserted, in the inserting direction, into the insertion port of said housing and for moving the stack of sheets from the non-feeding position to the feeding position when said storage box is moved into said inserted position, wherein said isolating means includes engaging means for moving the sheets from the feeding position to the non-feeding position against the biasing force of said biasing means in response to said sheet storage box being inserted into the housing.

4,478,402

NIP DRIVE FOR SHEET FEEDING APPARATUS

James L. Kane, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

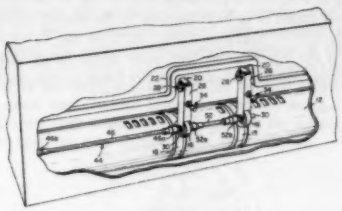
Filed Feb. 7, 1983, Ser. No. 464,290
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—100 **10 Claims**

1. Apparatus for feeding sheets seriatim along a travel path, said apparatus comprising:

rotary means, mounted on one side of such path for rotation about an axis extending transversely across such path, for delivering a sheet into such path;

means for defining a sheet drive nip with said rotary delivering means, said nip defining means including a plurality of rollers, means for independently supporting said rollers on the other side of such path, and means for adjustably

urging said rollers independently into continuous engagement with said rotary delivering means; and



flexible drive means, operatively coupled to said plurality of rollers, for driving said rollers to advance sheets along such path.

4,478,403

SHEET STACKING APPARATUS

Graham A. B. Byrt, Thrissell Works, Easton Rd., Bristol, BS5 0HE, England

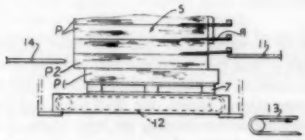
PCT No. PCT/GB80/00102, § 371 Date Feb. 13, 1981, § 102(e) Date Feb. 9, 1981, PCT Pub. No. WO80/02831, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 13, 1980, Ser. No. 237,162

Claims priority, application United Kingdom, Jun. 13, 1979, 7920581

Int. Cl.³ B65H *29/34*

U.S. Cl. 271—189 **13 Claims**



1. Apparatus for forming a stack from a succession of sheets with adjacent portions of the stack each containing a desired number of sheets and being offset with respect to each other comprising support means on which a stack is formed, feeding means for feeding sheets in succession in a first direction onto said support means, said feeding means including backboard means for arresting the lengthwise motion of said sheets, first moving means for moving at least one of said feeding means and said support means relative to the other in said first direction and then in an opposite direction at intervals corresponding to the times taken to form successive portions of said stack so that at least the leading and trailing edges of each portion of said stack are displaced from alignment with the corresponding edges of an adjacent portion, and means for moving the support means downwards as the stack grows so that the top of the stack remains at the approximate elevation of said backboard means.

4,478,404

PNEUMATIC EXTENSION BOTTOM STACKING

Gerald M. Garavuso, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1983, Ser. No. 490,071

Int. Cl.³ B65H *31/08*

U.S. Cl. 271—212 **9 Claims**

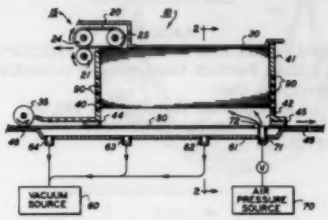
1. A bottom sheet stacking apparatus, comprising:

a sheet tray adapted to receive a stack of sheets, said tray including front, rear and side wall means which form an air tight seal around the stack of sheets, said rear wall serving as a registration means for incoming sheets into the tray;

feed belt means for forwarding sheets into said tray;

positive air pressure means located at the rear of the sheet stack for levitating the sheet stack by air flow while the sheets are inserted beneath the stack;

groove means in the bottom of said tray, said groove means being adapted to extend a major portion of the distance between said front wall and said rear wall means; and



vacuum means connected to a vacuum port located immediately before said front wall and within said groove means, said vacuum means being adapted to hold incoming sheets on said belt means until the sheets are completely in registration against said rear wall and since the incoming sheets will then cover said positive pressure means they are automatically levitated above said belt means.

4,478,405

POSITION CONTROL FOR RECYCLED ORIGINALS IN A COPYING APPARATUS

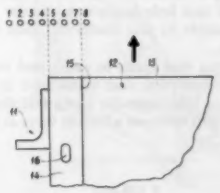
Bastiaan B. B. Eertink, Grubbenvorst, and Arie Leppink, Venlo, both of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Jul. 20, 1982, Ser. No. 400,090

Claims priority, application Netherlands, Jul. 21, 1981, 8103440

Int. Cl.³ B65H *7/10*

U.S. Cl. 271—227 **8 Claims**



1. In a position control system for a copying apparatus capable of producing multiple copies of an original fed thereinto and including transport means for passing the original through a transport path into a copying path and means for returning the original to the transport path for another pass into the copying path, said system including detecting means for sensing positions of the original in the transport path and correction means for displacing the original to a desired position in the transport path when the original is sensed to be away from such position, the improvement wherein said system comprises position reference means settable during a first pass of an original through the transport path to a certain control condition representing the then existent position of the original and control means operable during a subsequent pass of the original through the transport path for controlling the correction means by coaction of the position reference means and said detecting means,

said detecting means comprising at least one detector for sensing locations of a side edge of an original in the transport path, said position reference means comprising means for displacing said at least one detector in a direction transverse to the direction of travel of said side edge and means operable during a said first pass of an original to activate said displacing means and cause it while the original is travelling to position and then hold a said detector at a certain location thereof corresponding to the then existent location of said side edge.

4,478,406

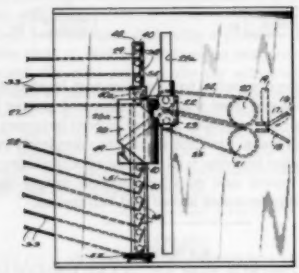
APPARATUS FOR SORTING PHOTOCOPIES

R. Clark DuBois, Fairfield, Conn., assignor to Gradco Systems, Inc., Santa Ana, Calif.

Filed Jun. 23, 1982, Ser. No. 391,795

Int. Cl.³ B65H *39/11*

U.S. Cl. 271—293 **7 Claims**



1. In a sheet-sorter

a plurality of sheet-receiving trays,

a pair of trunnions on each tray one trunnion projecting from each side of the tray,

a pair of rotatable drum-cams, each in operative juxtaposition to a trunnion and spacing the trays from one another,

a spiral slot in each cam for receiving the trunnions,

a rotatable shaft for each cam,

each cam having a central hole to receive one of said shafts, said shaft and said hole being non-circular whereby said cams are rotatable by said shafts and slide longitudinally on said shafts,

means for rotating said shafts to cause said trunnions to be successively received in said spiral slots in said cams to move said cams longitudinally along said shafts to successively form a gap between adjacent trays at opposite ends of said cams.

4,478,407

MONITOR GAME MACHINE

Katsuki Manabe, Tokyo, Japan, assignor to Kabushiki Kaisha Sigma, Tokyo, Japan

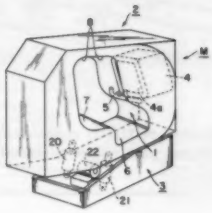
Filed Oct. 27, 1982, Ser. No. 436,992

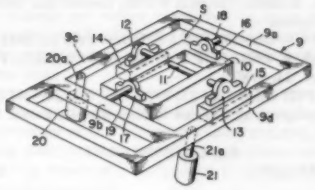
Claims priority, application Japan, Nov. 24, 1981, 56-174297[U]

Int. Cl.³ A63G *31/14, 31/16*

U.S. Cl. 272—18 **2 Claims**

1. A monitor game machine comprising: a cock-pit or driver cabin where a player is to be seated, a monitor disposed at the front of said cock-pit; frame means for supporting the cock-pit swingably backward and forward, and right and left; and a steering device operable by the player in response to pictures displayed on the monitor, said frame means having an inner frame which is supported swingably, on a first shaft extending in a direction, said shaft, by being oriented in said direction, supporting said inner frame so that said inner frame is swingable either in first backward and forward swingable directions or in second right and left swingable directions and an outer frame located so as to surround the inner frame, said first shaft being retained on retaining members secured to a support base, said outer frame being so connected, through a second shaft extending in a direction perpendicular to that of the first shaft, to the inner frame as to be swingable in the one of the first and second swingable directions different from the swingable directions of the inner frame, said outer frame being supported by operational means for swinging the frame means; said steering device being turnable right and left about its axis, and swingable along its axis backward and forward, the turn of the steering device causing the outer frame to incline right and left through the operational means, the backward and forward shifts of the steering device causing the inner frame to incline backward and forward through the operational means which comprises two cylinders connected at left and right sides of the outer frame and being operated independent of each other in response to the steering of the steering device.





4,478,408

HAND AND FOREARM PROTECTIVE DEVICE FOR THE INTERCEPTION OF THRUSTS IN MARTIAL ARTS

Georg F. Brückner, Hohenzollerndamm 174, D-1000 Berlin 31, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,611

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048467

Int. Cl.³ A63B *69/34*

U.S. Cl. 272—76 **5 Claims**

1. Hand and forearm protective device for the passive interception of thrusts in martial arts, comprising a polyurethane-integral foam cushion for an all-around covering of at least the

hand and forearm area of a person, said cushion having a substantially parallelepipedal elongated basic body having open ends and a central continuous channel extended axially therethrough between said open ends for receiving the hand and forearm, said cushion having, in vicinity of an end third of said channel, a crosspiece integral with said basic body projecting from one side of said channel diagonally into the cross section thereof and a gripping trough formed in said crosspiece laterally adjoining said channel for holding said cushion with the hand, said channel being substantially straight and one of said open ends exposing the fingers of the person within the basic body to view from outside said one end.

4,478,409

SWING CHAIN

Thomas C. Eads, 2657 Clove, San Diego, Calif. 92016, and Dean R. Carlson, P.O. Box 896, La Jolla, Calif. 92038

Filed Jul. 6, 1982, Ser. No. 395,486
Int. Cl.³ A63G *9/00*
U.S. Cl. 272—85 **8 Claims**

1. A hanging chair adapted to be suspended from an overhead structure, said chair comprising:

a generally rectangular seat support frame comprising a pair of elongated generally parallel side rails connected together at a front and a back end thereof by front and back cross members,

a generally horizontal seat panel secured to and extending between said side rails,

a back rest frame including a pair of generally parallel side members pivotally connected to the side rails of said seat support frame intermediate the ends thereof and biased to a position extending upwardly therefrom,

a back support panel secured to and extending between said side members,

cable means connected to said side rails for connecting to overhead support means for supporting said chair,

said side rails including arms integral therewith and extending downwardly and backwardly at the front end thereof, and

said front cross member is displaced aft and below the forwardmost portion of said seat support and connected between said arms.

4,478,410

FLEXIBLE SWING SEAT

William H. Ziegler, Jr., Bedford, Pa., assignor to Brown Group Recreational Products, Inc., Bedford, Pa.

Filed Sep. 16, 1982, Ser. No. 418,792
Int. Cl.³ A63G *9/00*
U.S. Cl. 272—85 **8 Claims**

1. An improved swing comprising

A. a flexible strap-like seat composed of

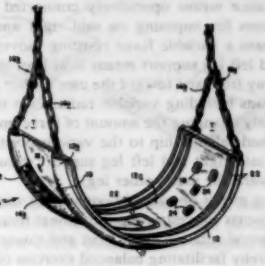
(1) generally flat main body, and

(2) a pair of resilient tubes formed integrally with the main body at the underside thereof which tubes extend along the front and rear edges of said main body;

B. first long, thin, flexible suspension means extending through one seat tube so that an end segment of said means extends from one end of the seat;

C. second similar suspension means extending through the other seat tube so that an end segment thereof extends from the opposite end of the seat; and

D. means for connecting the free end of each said segment to the other said suspension means at a location spaced from the adjacent end of the seat so that said connected-



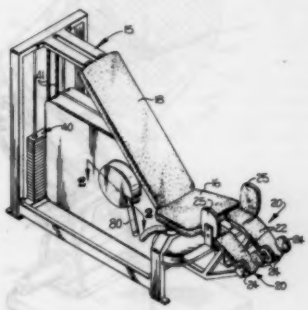
together segments and suspension means define flexible triangular hangers at the opposite ends of the seat which maintain said seat in a substantially level condition whereby the seat occupant is supported on top of both said suspension means between the hangers.

4,478,411

APPARATUS AND METHOD FOR EXERCISING THE ABDUCTOR OR ADDUCTOR MUSCLES

Dan D. Baldwin, Independence, Va., assignor to Nautilus Sports/Medical Industries, Inc., Lake Helen, Fla.

Filed Feb. 26, 1981, Ser. No. 238,454
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **5 Claims**



1. A method of exercising abductor or adductor muscles of the leg and comprising the steps of supporting the body of an exercising person for rotation of the right and left legs for movement away from and toward one another and about an axis extending through the corresponding hip joints, while restricting movement of the legs to equiangular bilateral rotation away from and toward one another and thereby facilitating balanced exercise of right and left legs, while imposing on the legs a force resisting movement of the legs in at least one of the directions of away from and toward the other leg, and while varying the amount of resisting force imposed in predetermined relationship to movement of the legs away from and toward one another during each exercising movement of the legs.

2. Appatatus for exercising abductor or adductor muscles of the leg and comprising:

torso supporting means for supporting a user's upper body,

right and left leg support means for supporting a user's corresponding right and left legs,

means mounting said right and left leg support means for rotation relative to said torso supporting means and about an axis extending through the corresponding hip joints of the user,

resistance means operatively connected to said mounting means for imposing on said right and left leg support means a variable force resisting movement of said right and left leg support means in at least one of directions of away from and toward the user's other leg, said resistance means including variable radius cam means for progressively changing the amount of force imposed in predetermined relationship to the various positions of movement of said right and left leg support means away from and toward the user's other leg,

linking means operatively connecting said right and left leg supports for restricting movement thereof to equiangular bilateral rotation away from and toward one another and thereby facilitating balanced exercise of the right and left legs of the user and

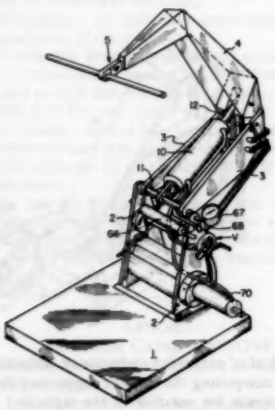
selection means interposed in said operative connection between said resistance means and said mounting means and being operable by the user for selectively applying said resistance force during either outward or inward equiangular bilateral movement of said right and left leg support means.

4,478,412

EXERCISE DEVICE AND CONTROL VALVE THEREFOR

Arthur M. Muir, 207 Van Doren Dr., Natrona Heights, Pa. 15065

Filed May 26, 1982, Ser. No. 382,136
Int. Cl.³ A63B *21/00*; F16K *5/10*
U.S. Cl. 272—130 **21 Claims**



1. An excercising device having a base, spaced brackets connected to and extending upwardly from said base; spaced arms connected at one end to the upper ends of said brackets; an operating arm pivotally connected to the other ends of said spaced arms; a handle connected to said operating arm; a hydraulic system including a cylinder connected to the upper ends of said brackets and said one end of said spaced arms, a piston within said cylinder, a piston rod connected between said piston and said operating arm; and a control valve forming a part of said hydraulic system, said control valve having:

A. a casing with a cylindrical bore and a plurality of passages extending from said bore to the outside of said casing, said passages connected into said hydraulic system;

B. a cylindrical valve rotor located within said cylindrical bore of said casing and having

(a) an upper chamber,

(b) a lower chamber,

(c) an orifice connecting said upper chamber with said lower chamber,

(d) means in said upper chamber to vary the amount of flow through said upper chamber,

(e) a plurality of ports formed in said rotor to permit flow between said chambers and at least one of said plurality of passages in said casing,

(f) a check in one of said chambers of said rotor, and

(g) means biasing said check in a closed position to prevent flow through one of said plurality of ports formed in said rotor in one direction and to permit flow through said port in the opposite direction; and

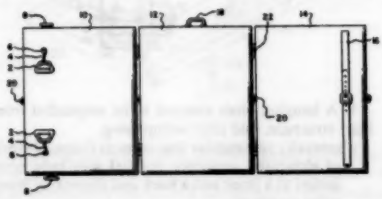
C. means for rotating said rotor relative to said casing to selectively align ports in said rotor with passages in said casing to permit flow in said hydraulic system through said control valve.

4,478,413

TORSION TYPE EXERCISE DEVICE

John T. Siwula, 145 Sanford Dr., Jamestown, N.Y. 14701

Filed Sep. 3, 1980, Ser. No. 160,836
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—134 **5 Claims**



1. An exercise device comprising:

(a) a support housing;

(b) a shaft having a longitudinal axis and mounted to said support housing for rotation and for a limited amount of longitudinal movement in opposite directions;

(c) a pulley freely rotatable on said shaft;

(d) a torsion spring concentric with said shaft and fixed at one end to said support housing, the torsion of said spring being increased or decreased upon rotation of said spring about the longitudinal axis thereof;

(e) a coupling element located on said shaft axially adjacent said pulley and fixed to said shaft for rotation therewith and for longitudinal movement therewith, said coupling element being fixed to the other end of said torsion spring;

(f) said coupling element and said pulley having cooperating formations thereon for holding said coupling element and pulley in locking engagement upon relative movement of said coupling element and pulley axially toward each other into engagement thereby preventing relative rotation therebetween, said formations being arranged at spaced locations circumferentially about said shaft and in alignment such that said coupling element and pulley are engageable at various selectable relative rotational positions, said pulley and coupling element being disengageable upon relative outward axial movement thereof;

(g) a cable fixed at one end to said pulley wound therearound and having a hand grip at the other end thereof whereby as the user pulls said cable by means of said grip to withdraw said cable said torsion spring provides resistance thereto and when the user releases said grip said torsion spring retracts said cable, said cable having means operatively associated therewith for limiting the extent of movement of said cable and pulley during retraction so as

to maintain a predetermined amount of tension applied to said pulley by said torsion spring;

(h) whereby when said shaft is moved a small distance in one longitudinal direction said coupling element and pulley are disengaged and said shaft can be rotated free of said pulley to change the torsion in said spring whereupon longitudinal movement of said shaft in the opposite direction returns said coupling element and pulley into locking engagement and the changed torsion of said spring is applied to said pulley.

4,478,414

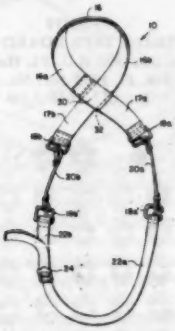
ELASTIC ANKLE AND KNEE EXERCISER

Lawrence Molloy, 84-49 265th St., Floral Park, N.Y. 11001

Filed Feb. 28, 1983, Ser. No. 470,058

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—134 **1 Claim**



1. An exercise device for knees and anlkes wherein a user sits on a chair while performing exercises, said device being attachable to the back of a chair and comprises:

(a) a first strap comprising two adjacent strap members joined to each other over a substantial length of each of said strap members, each of said strap members having a loop formed at one end thereof, said loop being joined to each other at substantially 90°, each one of said two adjacent strap members having end extension that extends through the loop at its opposite end and causes the first strap to a form a noose for a user's limb,

(b) an elastic member attached to each end of said extensions,

(c) a second strap for wrapping around a chair, the ends of the second strap being attached to the ends of said elastic members, and (d) adjustable means in said second strap to remove slack therein when a user is performing an exercise.

4,478,415

ENCAPSULATED BASKETBALL BACKBOARD

Dale A. Shaffer, Lebanon; John W. Kay, and Maurice H. Basquin, both of Frankfort, all of Ind., assignors to Harmeson Manufacturing Co., Inc., Frankfort, Ind.

Filed Jul. 13, 1982, Ser. No. 397,827

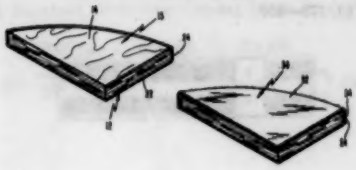
Int. Cl.³ A63B *63/08*

U.S. Cl. 273—1.5 R **10 Claims**

1. A basketball backboard comprising:

(a) a substrate core member formed of a substantially flat rigid material of generally rectangular configuration having corresponding front and rear surfaces and peripheral edges therebetween, the rear surface being covered with a layer of paint;

(b) a rigid plastic shell member having a first portion dimensioned to cover the front surface of the substrate member and including peripheral edge portions integrally formed with and extending generally orthogonally from the first portion a distance equal to the thickness of the core to contact and cover the peripheral edges of the substrate without overlapping the rear surface; and



(c) adhesive means for fastening the plastic shell member to the substrate member, the plastic shell and painted rear surface tending to retard penetration of moisture into the core.

6. The basketball backboard as claimed in claim 1, wherein said plastic shell member is premolded.

4,478,416

TENNIS RACQUET WITH OFFSET, OVAL-SHAPED HEAD

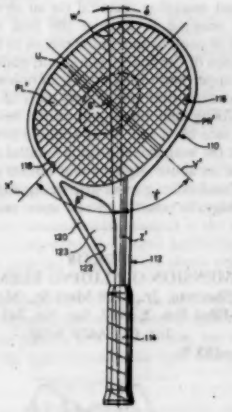
Carlo Gibello, Corso Vittorio Emanuele 5, Torino, Italy

Filed Sep. 2, 1982, Ser. No. 414,172

Claims priority, application Italy, Sep. 4, 1981, 53581/81[U]

Int. Cl.³ A63B *49/02*

U.S. Cl. 273—73 C **8 Claims**



1. A tennis racket constituted by a frame with:

a strung head which is substantially oval and has a major axis and a minor axis perpendicular to each other and intersecting at a geometric centre of the head, the head having two opposed ends on its major axis, and

a straight shaft having an end part remote from said head which is formed as a hand grip, the shaft and the hand grip having a common longitudinal axis passing substantially through said geometric centre of the head;

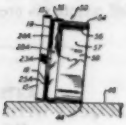
wherein the said longitudinal axis of said shaft and hand grip forms respective complementary angles of between 40° and 50° with the said major axis and with the said minor axis whereby upon gripping the racket for a normal ground stroke the major axis of said head will be angled upwardly.

4,478,417

HOLDER FOR GAME PIECES

John T. Shamsid-Deen, 11815 Christopher Ave., Inglewood, Calif. 90303

Filed Apr. 1, 1983, Ser. No. 481,474
Int. Cl.³ A63F 1/10, 9/20
U.S. Cl. 273—150 3 Claims



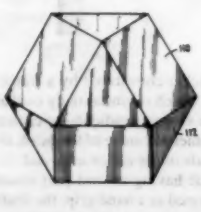
1. A game piece holder assembly to be rested upon a planar support and comprising a multiplicity of flat game pieces each having an indicia face with game indicia thereon and an opposite plain face, a strip of first contact engaging material on said flat plain face, a planar holder plate, at least one strip of a second contact engaging material on an obverse face of said holder plate adapted to receive the first contact engaging material strip of each of said game pieces to hold the pieces to the obverse face of the holder plate, said plate having opposite holder plate upper and lower edges; an oblong hand grip with a long axis between first and second ends of said oblong hand grip, means fixing said hand grip to the reverse face of said holder plate, said hand grip being secured to said reverse plate face such that the long axis thereof is parallel to the plane of the plate and is at an acute angle to said holder plate lower edge, a first end of said oblong hand grip being adjacent said holder plate lower edge, in position to rest upon said planar support.

4,478,418

THREE-DIMENSIONAL SLIDING ELEMENT PUZZLE

Benjamin F. Sherman, Jr., 6329 Mori St., McLean, Va. 22101

Filed Feb. 2, 1982, Ser. No. 345,051
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S 2 Claims



2. A three-dimensional sliding element puzzle comprising

a spherical center support including means forming at least eight crossing tracks wherein each track forms a complete circle in the support and includes a pair of outer lips extending toward each other to define a narrow outer slot and an inner enlarged sliding path,

a plurality of at least fourteen outer members in a cuboctahedron arrangement wherein six of the outer members have faces which are square-like and the other eight outer members have faces which are equilateral-triangle-like, one of the outer members being fixed on the support and the other outer members being slidable on the support,

legs mounted on the slidable outer members and extending through the narrow slot of the corresponding tracks,

disk-like feet mounted on inner ends of the respective legs for sliding in the inner sliding paths and for being engaged by inner surfaces of the lips to slidingly retain the slidable members on the support,

said outer members forming a shell completely enclosing the spherical support, and

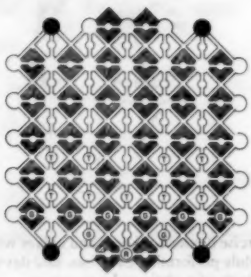
said outer members when in one relative position defining at least four pairs of hemispherical shells wherein one hemispherical shell of each pair of the pairs of hemispherical shells is rotatable relative to the corresponding other hemispherical shell.

4,478,419

FOOTBALL TYPE BOARD GAME

Richard D. Maiers, Box 340, R.D. #1, Hazleton, Pa. 18201

Filed Jun. 17, 1982, Ser. No. 389,397
Int. Cl.³ A63F 3/00
U.S. Cl. 273—259 6 Claims



1. Game apparatus for playing a game between two opponents, comprising: a playing surface having a plurality of two different sets of spaces and a network of routeways, said two different sets of spaces comprising: a first set of spaces arranged in an array of non touching rows and columns, a second set of spaces located between said spaces of said first set, said second set of spaces having the borders of four of said second set of spaces located diagonally between said columns of said first set of spaces, all said spaces being available resting areas for playing pieces, and

each said second set space having three separate resting area means, one central resting area means located and marked directly in the center of said second set of spaces so as to enable a landing place for playing pieces and two secondary resting area means located and marked on opposite sides of said central resting area means so as to enable captured playing pieces to remain stationed and usable on said playing surface, and

said network of routeways connecting said first set of spaces to each other vertically between said rows, horizontally between said columns and diagonally one said row up one said column to the right and one said row up one said column to the left, said vertical routeways dividing in half said second set of spaces so as to enable passage through said second set of spaces located between said rows, said horizontal routeways dividing in half said second set of spaces so as to enable passage through said second set of spaces located between said columns, said diagonal routeways being longest in length, crisscrossing each other perpendicularly and passing along the borders of four of said second set of spaces so as to enable passage through

said four bordering spaces located diagonally between said columns, and

unique opposing sets of playing pieces being different in men and power than each other, one set using said playing surface means so as to enable advancement of certain playing pieces, with the opposing set using said playing surface means so as to enable capturing of the opposing set.

4,478,420

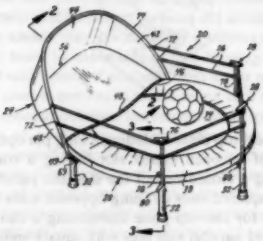
SOCCER TRAINING AND PRACTICE DEVICE

Gregory E. Sowards, 1415 S. Maple, Carthage, Mo. 64836

Filed Mar. 4, 1983, Ser. No. 472,072

Int. Cl.³ A63B *69/00*

U.S. Cl. 273—411 **20 Claims**



1. A soccer training and practice device comprising:

a trampoline having a resilient surface forming a playing surface;

ball-rebounding means in communication with the playing surface, the ball-rebounding means having a bottom, a backwall at the rear of the bottom, and two sidewalls, one on each side of the bottom and defining an open front communicating with the playing surface, the bottom being inclined with respect to the playing surface so that a ball propelled into the ball-rebounding means from the playing surface has a tendency to return thereto.

4,478,421

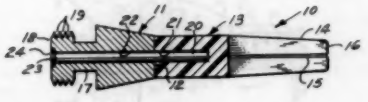
DART BODY WITH A SPINNING HEAD

John A. Michalicka, and John N. Michalicka, both of 249 Whitehall Rd., South, Garden City, N.Y. 11530

Filed Oct. 17, 1983, Ser. No. 542,417

Int. Cl.³ A63B *65/02*

U.S. Cl. 273—420 **1 Claim**



1. A dart structure, comprising, in combination, a metal, frusto conically-shaped main body, a plastic tail member adjacent a rear end of said main body, said tail member being rearwardly tapered, a plurality of transverse cross slots through a rear portion of said tail member, stabilizing fins being secured in said cross slots, a forwardly extending shank formed integrally with a forward end of said main body and a circular, enlarged head formed on a forward end of said shank, a plurality of annular grooves around said head, and a steel shaft affixed at its rear portion within a longitudinal bore through a front portion of said tail member and a front portion of said steel shaft extending axially through said main body, said shaft being freely and rotatably received in a longitudinal bore through said main body, and a diametrically enlarged flange formed on a forward end of said steel shaft for abutment with a forward face of said head.

4,478,422

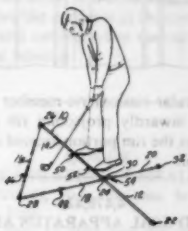
GOLF PRACTICING AID

Vernon F. Blanchard, 30765 River Crossing, Birmingham, Mich. 48010

Filed Apr. 4, 1983, Ser. No. 481,598

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—187 R **7 Claims**



1. A practice aid for a golfer comprising a length of cord having a plurality of segments including:

a base segment having graduations at intervals of a first preselected length, the base segment being of sufficient length to allow a golfer to take his stance adjacent thereto,

first and second anchoring means fixedly secured at each end respectively of the base segment, the first and second anchoring means each having an eyelet adapted to receive the shank portion of a golf tee;

a reference segment fixedly secured at its first end to the second anchoring means, the reference segment having graduations at intervals of a second preselected length, the second length being greater than the first length;

third anchoring means fixedly secured at the second end of the reference segment, the third anchoring means having an eyelet adapted to receive the shank portion of a golf tee;

a foot gauge segment fixedly secured at its first end to the third anchoring means, the foot gauge segment having graduations at intervals of a first preselected length; and

fourth anchoring means fixedly secured at the second end of the foot gauge segment, the fourth anchoring means having an eyelet adapted to receive the shank portion of a golf tee;

whereby, the golf aid device may be secured to the ground to form a configuration resembling a right triangle defining an area to place a golf ball therein, the reference segment being the hypotenuse of the right triangle so formed.

4,478,423

OIL SEAL AND UNITIZED SEAL CARRIER FOR RECIPROCATING SHAFT

Timothy A. Hjelsand, and Paul A. Moore, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 18, 1984, Ser. No. 601,835

Int. Cl.³ F16J *15/18*

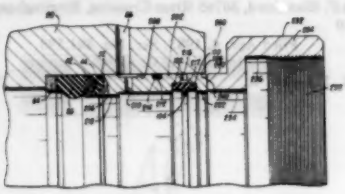
U.S. Cl. 277—59 **5 Claims**

1. In combination, an improved seal carrier assembly and improved wiper seal for use therewith in sealing the high pressure fluid end of a reciprocating plunger pump, wherein: the improved seal carrier assembly comprises:

a unitized seal carrier comprising an annular, elongated cylindrical member having on the interior thereof, a first annular recess and second annular recess located within the first annular recess and, on the exterior thereof, a first annular recess having, in turn, a plurality of apertures extending therefrom to the interior of the cylindrical

member and a plurality of apertures extending from the exterior of the cylindrical member to the second annular recess located within the first annular recess located on the interior of the cylindrical member; and

the improved wiper seal comprises:



an annular, circular elastomeric member having a rim portion and an inwardly projecting rib portion extending inwardly from the rim portion located substantially in the center thereof.

4,478,424

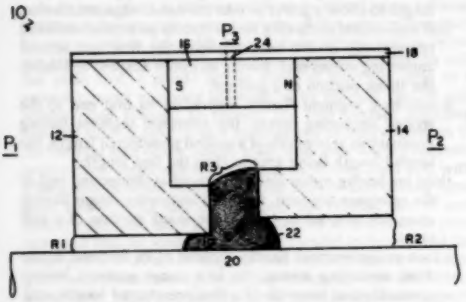
FERROFLUID SEAL APPARATUS AND METHOD

Kuldip Raj, Merrimack, N.H., assignor to Ferrofluidics Corporation, Nashua, N.H.

Filed Jan. 27, 1984, Ser. No. 574,359

Int. Cl.³ F16J *15/40, 15/54*

U.S. Cl. 277—80 **20 Claims**



1. A ferrofluid seal apparatus which comprises:

(a) a magnet means adapted to surround a shaft element to be sealed and to provide poles of opposite polarity;

(b) first and second pole pieces, each having a one and another end, one end of each pole piece in a magnetic-flux relationship with the one and the other ends, respectively, of the magnetic means, the other end of each pole piece extending into a noncontacting relationship with the surface of the shaft element, to define a first and a second radial gap, the first and second radial gaps having different dimensions, the first and second pole pieces having projections which extend toward each other, to define an interstage gap and an annular cavity therebetween, the interstage gap having a dimension different from the first or second radial gap;

(c) ferrofluid retained in the first and second radial gaps and the interstage gap, by the magnetic flux of the magnetic means, to form a single O-ring ferrofluid seal about the surface of the shaft element which separates a first region on one side and a second region on the other side of the ferrofluid seal;

(d) a passageway means extending into the annular cavity and to a third region; and

(e) the single ferrofluid seal having therein three or more areas of different magnetic-flux density, whereby, subject to the pressure in each of the said regions, the ferrofluid seal acts as a two-way ferrofluid valve which controls the flow of gas between the said regions.

4,478,425

FIFTH WHEEL PLATE

John M. Benko, 1439 River Dr., Munster, Ind. 46321

Filed Oct. 21, 1982, Ser. No. 435,563

Int. Cl.³ B62D *53/08*

U.S. Cl. 280—433 **2 Claims**

1. A fifth wheel top plate including a king pin opening in the general form of an open ended slot having a rounded rear portion defining a closed end of the slot and parallel side leg portions with squared ends defining opposite sides of the slot, an insert piece for the top plate comprising a shoe having a rounded rear and parallel side legs with square ends fitted into said slot and welded to the top plate flush with top and bottom surfaces of the plate, said shoe comprising a lining for the inner surfaces of the rear and side leg portions of said slot, said shoe having a rectangular cross section, said top plate chamfered around the top edge of said slot, and weld metal in the groove formed by the chamfer integrally securing said shoe within the slot entirely around said rounded rear portion along said side leg portions and at said squared ends.

4,478,426

SKI SAFETY BINDING

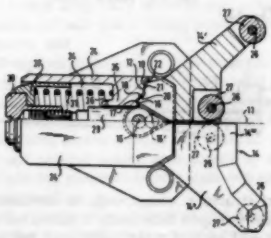
Georg Scheck, Leonberg, Fed. Rep. of Germany, assignor to Geze GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,625

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 3129536

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—625 **8 Claims**



1. A ski safety binding for mounting on a ski, the ski safety binding comprising a housing having a central longitudinal axis; sole clamp means provided at said housing for locating a ski boot longitudinally and transversely relative to the ski; first and second abutment surfaces provided on said housing on respective sides of said central longitudinal axis, each of said first and second abutment surfaces having a respective region extending in a direction generally transverse to said central longitudinal axis and being obliquely inclined relative thereto;

third and fourth abutment surfaces provided on said sole clamp means, said third and fourth abutment surfaces respectively facing and cooperating with said regions of said first and second abutment surfaces and having respective lightly convexly rounded regions which are also generally obliquely inclined relative to said central longitudinal axis; a vertical pivot axle extending through said sole clamp means; a transverse wall in said housing, said transverse wall having an aperture therein and first and second sides; a draw rod having first and second ends, said draw rod being connected by said first end to said vertical pivot axle on said first side of said transverse wall and extending through said aperture in said transverse wall; and spring means on said second side of said transverse wall, said spring means acting on said second end of said draw rod to bias said sole clamp means towards said housing to produce respective points of contact between said first and second abutment surfaces and said cooperating third and fourth abutment surfaces; wherein said abutment surfaces are arranged so that said sole clamp means may pivot, under a sideways force applied via said ski boot, to either side of said housing about a respective one of said points of contact, from a rest position adopted when said boot is present in said binding to a release position, with simultaneous outward movement of the respective one of said points of contact as the associated one of said lightly convexly rounded regions rolls on the associated one of said first and second surfaces; and wherein the associated one of said points of contact move in the direction of said central longitudinal axis in substantially exactly the same way as the vertical pivot axle moves in the direction of said central longitudinal axis.

4,478,427

FOLDABLE INFANT STROLLER

Richard E. Hyde, and Lee T. Carmichael, both of Los Angeles, Calif., assignors to California Strolee, Inc., Compton, Calif.

Filed Dec. 27, 1982, Ser. No. 453,147
Int. Cl.³ B62B 7/08
U.S. Cl. 280—642 **5 Claims**

1. An infant stroller, foldable from an open position to a more compact closed position by a simple one hand operation, the stroller comprising:

a. a main frame assembly having pivotally attached frame members foldable between open and closed positions;

b. a U-shaped member, having side portions and a base portion, the side portions of which are attached to said frame assembly, such that downward movement of said U-shaped member causes said frame assembly to fold, and upward movement causes said frame assembly to unfold, said base portion of said U-shaped member extending rearwardly and upwardly therefrom to a position where it may be grasped and used as a handle by the operator of the stroller;

c. a seat assembly attached to said frame; and

d. means for securing the carrier to a closed position and to an open position, said means comprising:

(i) a latch assembly on said U-shaped member, said latch assembly having a hook pivotally attached to said U-shaped member and actuating means for causing the hook to pivot, said actuating means extending up said U-shaped member to a position on the base portion of said U-shaped member where it may be comfortably reached by the hand of a standing operator of the carrier; and

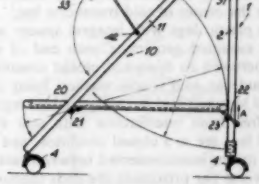
(ii) first and second catches attached to said frame and positioned such that said hook engages the first of said catches when the carrier is in the open position and the second of said catches when the carrier is in the compact, closed position.

4,478,428

FOLDING CART FOR SERVING MEALS OR THE LIKE

Franco Ziliani, Brescia, Italy, assignor to Norda Tubazioni S.P.A., Brescia, Italy

Filed Dec. 22, 1981, Ser. No. 333,521
Claims priority, application Italy, Jan. 9, 1981, 19074 A/81
Int. Cl.³ B62B 3/02
U.S. Cl. 280—651 **7 Claims**



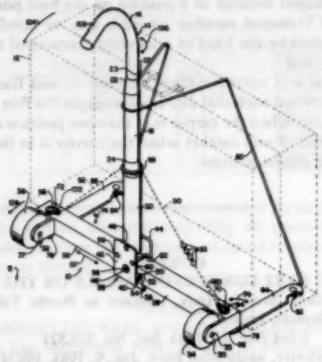
1. A folding cart comprising a pair of elongated elements extending substantially parallel to each other and forming a first upright, said elongated elements having at one end thereof upper legs extending aligned to each other and substantially perpendicular to said elongated elements, a second substantially U-like shaped upright having a bottom portion provided with castor wheels and lateral arms having upper portions extending substantially perpendicular to said lateral arms and aligned with said upper legs of the first upright and in pivotal engagement therewith thereby defining together with said upper legs a pivotal connection between said first and second uprights, said pivotal connection defining an axis of pivotal rotation in alignment with said upper legs and upper portions, a lower deck pivotally connected at a middle region thereof to lower portions of said lateral arms of said U-shaped second upright and slidably engaging, at an edge portion thereof, said first upright, as well as an upper deck having a bracket element rigid with an edge portion of said upper deck and inserted in a bushing rigidly carried on the elongated elements so as to form an articulation axis between upper deck and first upright, said upper deck having at a middle region thereof, at its lower side in the unfolded condition of the cart, hinge elements permanently accomodating a central portion of a U-like shaped rod-like element having lateral arms connected to said central portion, said lateral arms of said U-like shaped rod-like

element being pivotally connected at an end thereof with middle portions of the lateral arms of said second U-shaped upright.

4,478,429
COLLAPSIBLE CARRIER

John F. Adams, 65 Lanar'k Rd., Apt. #9, Brighton, Mass. 02135

Filed Dec. 1, 1982, Ser. No. 445,981
Int. Cl.³ B62B 1/04
U.S. Cl. 280—655 26 Claims

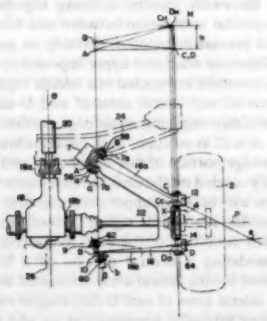


1. A collapsible carrier comprising:
a telescopic handle;
a plastic base including a transverse bar and two wheel brackets integrally formed with said base and disposed one proximate each end of said bar;
a slide bracket slidably mounted on said transverse bar and pivotably attached to one end of said handle;
latching means for releasably locking said slide bracket proximate the center of said transverse bar;
two flexible plastic legs with integral spacer washers, one pivotably mounted proximate each end of said bar for pivoting between an open and closed condition with respect to said bar, said spacer washers being disposed between said legs and said bar to space said legs apart from said bar free from interference with said slide bracket when said legs are in a closed condition; and
flexible link means interconnected between said handle and said transverse bar proximate the ends thereof.

4,478,430
STRUT TYPE VEHICLE SUSPENSION MECHANISM

Jiro Maebayashi, and Shoji Kasai, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 26, 1982, Ser. No. 436,793
Claims priority, application Japan, Oct. 29, 1981, 56-173293
Int. Cl.³ B60G 3/06
U.S. Cl. 280—690 6 Claims

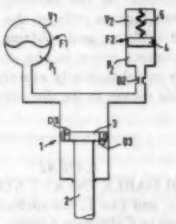


1. A vehicle suspension mechanism including carrier means for carrying a rear wheel rotatably about an axis of rotation, strut means having an upper end connected with a vehicle body and a lower end connected with said carrier means, swingable arm means pivotally connected through resilient means with said vehicle body at a first forward point and a first rearward point, said first forward front spaced longitudinally from said first rearward point, and with said carrier means at a second forward point and a second rearward point, said second forward point spaced longitudinally from said second rearward point, said first rearward point being at a higher level than a plane defined by the remaining three points.

4,478,431
SUSPENSION SYSTEM FOR VEHICLES

Rudi Muller, Egenhofen, and Axel Pauly, Isenbuttel, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,668
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044287
Int. Cl.³ B60G 11/26
U.S. Cl. 280—710 29 Claims



1. A suspension system for a vehicle comprising displacer means responsive to the relative motions between a vehicle wheel and the vehicle body, said displacer means including means for containing a flow medium, at least two spring means connected to said means for containing a flow medium which can be loaded by said flow medium, said at least two spring means being continuously responsive to flow of said flow medium, one of said at least two spring means being less progressive than the other of said at least two spring means, at least one throttle means for continuously controlling the movement of flow medium into said one of said at least two spring means, said at least two spring means having different load-dependent spring rate changes whereby the distribution of the volume proportions of flow medium displaced to each of the spring means differs depending on the static flow medium pressure and whereby said at least one throttle means is disposed in front of said less progressive spring means and operates as a function of load.

4,478,432
LOCKING STRUCTURE FOR A SEAT BELT SLIDER IN A MOUNTING RAIL

Hideoki Matsuoka, Yokohama, and Yoshimi Yamamoto, Shizuoka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 30, 1979, Ser. No. 62,314
Claims priority, application Japan, Aug. 9, 1978, 53-97588
Int. Cl.³ B60R 21/10
U.S. Cl. 280—804 3 Claims

1. In a vehicle which is equipped with a passive seat belt system which comprises a mounting rail fixed along the longitudinal direction of the vehicle, a slider which is fitted slidably in the mounting rail, a seat belt one end of which is fixed to the slider, and a motor which is controlled according to the opening and shutting of the vehicle door,

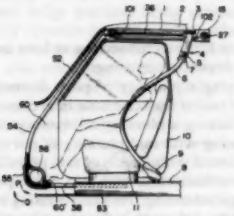
a locking device which locks the slider in its rearmost position on the mounting rail, comprising:

a first engagement assembly which is attached to the slider;

a second engagement assembly fixed with respect to the body of the vehicle;

and a driver member which connects the motor to the slider and transmits force from the motor to propel the slider to and fro along the rail, and whose end portion, comprising a catch-releasing portion, is loosely connected to the slider with a certain relatively small amount of movement allowed therebetween;

whereby, when the motor is activated so as to move the slider by the driver member to its rearmost position along the rail, the first engagement assembly and the second engagement assembly engage together so as to lock the slider in this position on the rail, the driver member assuming a first position with respect to the slider and the body engagement assembly which permits this engagement;



and, when the motor is activated, with the members in this position, in the direction to move the slider forward along the rail, the driver member moves to a second position relative to the slider wherein the catch-releasing portion of the driver member breaks the engagement of the first and second engagement assemblies, so that the slider is released from its locked engagement in the rearmost position on the rail and is allowed to be moved forward along the rail by the driver member, wherein the first engagement assembly is a catch, and the second engagement assembly is a locking plate, and wherein the locking plate is a plate with a hole through it, and the catch comprises a latch member, part of the latch member protruding through the hole when the locking device is engaged, and wherein the catch-releasing position nudges the latch member to release it from the hole, when the driver member is moved from the first to the second position with the locking device engaged.

4,478,433

SAFETY SEATBELT RETRACTOR

Masahiro Taguchi, Okazaki; Satosi Kuwakado, Aichi, and Noboru Tsuge, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 29, 1982, Ser. No. 427,819

Claims priority, application Japan, Nov. 4, 1981, 56-176624; Dec. 11, 1981, 56-200677

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—807 **23 Claims**

1. A retractor for a safety seatbelt to be fastened on a passenger, for use in a vehicle having at least one seat for the passenger, said retractor comprising:

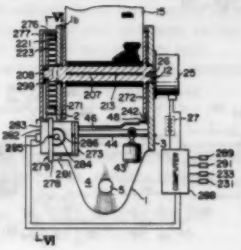
a frame adapted to be fixed to the vehicle;

a winding shaft rotatably mounted on said frame, the seatbelt being normally wound around said winding shaft;

spring means for applying a weak biasing force to said winding shaft in such direction as to cause the seatbelt to be wound therearound;

motor means drivingly connected to said winding shaft, said motor means, when operated, driving said winding shaft to rotate the same so as to cause the seatbelt to be forcibly wound around said winding shaft; and

control means operative in response to one of two conditions, one being such that the seatbelt is unwound from



said winding shaft and the passenger gets off the vehicle, and the other condition being such that the seatbelt is unwound from said winding shaft and the seatbelt is unfastened, for controlling said motor means so as to cause the same to be operated.

4,478,434

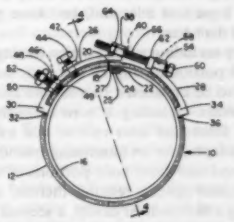
HOSE MENDER DEVICE

Gerald R. Little, Rte. One, Cutler, Ill. 62238

Filed Oct. 14, 1982, Ser. No. 434,188

Int. Cl.³ F16L *55/18*

U.S. Cl. 285—15 **10 Claims**



6. A coupling device for coupling adjacent ends of relatively flexible members comprising

an open ended tubular member having a slit formed therethrough extending the length thereof,

means attached to the tubular member including a first portion attached to the tubular member on one side of the tube slit and a second portion attached to the tubular member on the opposite side of the slit,

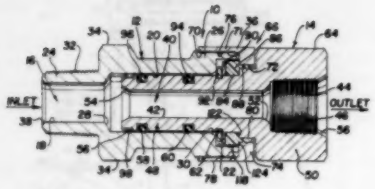
means connecting the first and second portions including threaded means operable in one direction to draw the first and second portions toward each other and in another direction to push the first and second portions away from each other,

other threaded means on the first portion adjustable into engagement with the tubular member adjacent one side of the slit, said other threaded member being adjustable on said first portion to move the slit edge adjacent thereto radially inwardly relative to the other slit edge whereby the threaded means connecting the first and second portions can be operated in said one direction to move the portions of the tubular member adjacent to the slit into a lapped condition to reduce the cross sectional size of the tubular member to facilitate inserting the tubular member into the ends of relatively flexible members to be coupled.

4,478,435
SWIVEL CONNECTOR

Charles L. Cheshier, 7514 Cottonwood Ct., Garland, Tex. 75042, and Don W. Lewis, 200 Lynge, Allen, Tex. 75002

Filed Nov. 5, 1982, Ser. No. 439,396
Int. Cl.³ F16L 35/00
U.S. Cl. 285—39 22 Claims



1. Swivel connector apparatus for connecting lines conveying pressurized fluids therein and providing the capability for one line to move with respect to the other line, said apparatus comprising:

a female body including a first portion having an inlet end and a second portion having an exit end, said inlet end being adapted to be connected to a first fluid line, said female body further including a bore extending axially therethrough from said inlet end to said exit end, said bore including a first bore portion, a second bore portion and a third bore portion positioned in axially spaced relationship starting from said inlet end, said bore portions being of different diameter;

a male body including a first portion having an inlet end and a second portion having an exit end, said exit end being adapted to be connected to a second fluid line, said male body further including a bore extending axially therethrough from said inlet end to said exit end, said first portion adapted for an interfitting relationship within said second and said third bore portions of said female body and in radial spaced relation thereto, said first portion including a first annular cavity, a second annular cavity, a third annular cavity, a fourth annular cavity and a circumferential shoulder positioned in axially spaced relationship starting from said inlet end;

first bearing means operatively positioned in said first annular cavity and capable of engagement with said second bore portion of said female body;

first sealing means operatively positioned in said second annular cavity and capable of engagement with said second bore portion of said female body;

second sealing means operatively positioned in said third annular cavity and capable of engagement with said second bore portion of said female body;

second bearing means positioned in operative engagement with said circumferential shoulder and capable of engagement with said third bore portion of said female body;

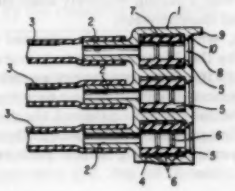
retaining means to rotatably connect said female body and said male body to each other and disposed between the outer surface of said second portion of said female body and said second bearing means; and

locking means operatively positioned in said fourth annular cavity and capable of maintaining said second bearing means in operative engagement with said circumferential shoulder and with said retaining means while permitting relative rotational movement between said female body and said male body.

4,478,436
HOSE CONNECTOR

Nobuyuki Hashimoto, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 202,239, Oct. 30, 1980, abandoned.
This application Nov. 2, 1983, Ser. No. 547,464
Claims priority, application Japan, Nov. 5, 1979, 54-143500
Int. Cl.³ F16L 39/00
U.S. Cl. 285—137 R 3 Claims



1. A connector for interconnecting at least one hose with a fluid operating device, comprising:

a housing having a plurality of ports formed therein such that each of said at least one hose interconnects therewith;

said housing having a plurality of openings formed therein communicating with said plurality of ports, respectively;

a bushing mounted within each of said plurality of openings for fluid communication with said fluid operating device;

a sealing flange extending from said housing of said connector such that said sealing flange prevents each of said bushings from being axially removed from said housing;

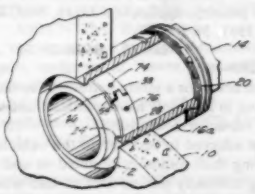
a plurality of annular sealing means formed on the outer periphery of each said bushing for airtight engagement with said housing wherein said plurality of annular sealing means formed on the outer periphery of each said bushing further comprises a plurality of first sealing means triangular in cross section such that each said bushing provides an equal sealing capacity in both an upstream and downstream direction; and

a plurality of annular sealing means formed on the inner periphery of each said bushing wherein said plurality of annular sealing means formed on the inner periphery of each said bushing further comprises a plurality of second sealing means triangular in cross section such that each said bushing provides an equal sealing capacity in both an upstream and downstream direction wherein equidistant air gaps are formed between said first and second sealing means.

4,478,437
RADIALLY EXPANDABLE LOCKING SLEEVE DEVICE

William O. Skinner, Grabill, Ind., assignor to Press/Seal Gasket Corp., Fort Wayne, Ind.

Filed Jul. 27, 1981, Ser. No. 287,049
Int. Cl.³ F16L 5/00, 21/00, 17/00, 55/00
U.S. Cl. 285—189 11 Claims



1. An expandable locking sleeve for use in radially expanding a tubular gasket of elastomeric material into compressive sealing engagement with the wall of a cylindrically shaped

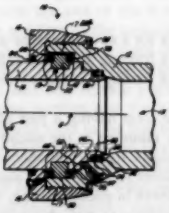
opening and comprising a cylindrical relatively stiff but resiliently flexible strip of metal having opposed abuttably engageable ends, said strip being movable between two positions in which end portions thereof may first be radially overlapped and secondly may be interlockingly engaged end-to-end, the first of said end portions having a short substantially flat sided channel-shaped portion provided with a recess disposed between the opposite side edges of the strip and extending circumferentially from and opening through the end edge of said first end portion, said channel-shaped portion having two opposed retaining shoulders extending in a direction substantially circumferentially of said strip from said end edge which further define said recess, the second of said end portions having a longitudinally projecting tab, said second end portion also having a radially inwardly displaced step portion, said tab being adapted to be slidably received by said recess between said retaining shoulders with the end edge of said first end portion in juxtaposed abuttable alignment with said step portion, two ledge portions on said first end extending laterally opposite and integrally from said two retaining shoulders, respectively, said ledge portions being substantially flat and displaced radially opposite from the outer surface of said channel-shaped portion substantially in parallelism therewith, said ledge portions also extending back from said first end edge, stepped side portions connecting said ledge portions to said retaining shoulders, respectively, and forming an integral part thereof, said second end having two circumferentially extending substantially flat fingers on opposite sides, respectively, of said tab, said fingers being engageable in radially overlying relation with said ledge portions, respectively, when said tab is received by said recess, the radially outer surface of said tab or channel-shaped portion being of extended area lying substantially within the circumferential outer surface of said strip as a substantially uninterrupted cylindrical circumferential continuation thereof when said tab is engaged with said recess and said first end edge is immediately adjacent to said step portion.

4,478,438

SWIVEL JOINT

Peter Elorriaga, Jr., Kingwood, Tex., assignor to Best Industries, Inc., Houston, Tex.

Filed Nov. 18, 1982, Ser. No. 442,564
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—276 **8 Claims**



1. A swivel joint for handling fluids at pressures as high as 20,000 psig comprising:

a. open ended male and female pipe sections having bores extending therethrough, the pipe sections adapted to connect concentrically and rotatably with the open-end portions overlapping to form a common central flow bore; said male pipe section having a circumferential groove formed in the outer surface

b. an annular split ring mounted circumferentially in said groove about the male pipe section, said split ring being generally tee-shaped in longitudinal cross-section and comprising at least two segments defining longitudinal annular gaps therebetween, said split ring further comprising:

at least one thrust load transfer surface; and

at least one radial load transfer surface disposed perpendicularly to said thrust load transfer surface and disposed in alignment with the outer surface of said male pipe section adjacent said groove;

c. at least two annular bearings disposed at opposite sides of said split ring and engaging the inner surface of said female pipe section and said thrust load transfer surface, said radial load transfer surface and said outer surface of said male pipe section adjacent said groove; and

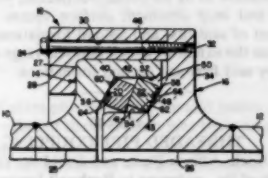
d. means for concentrically and rotatably connecting the male and female pipe sections together.

4,478,439

REDUNDANT SEAL RING COUPLING ASSEMBLY

Jack A. Arnold, Littleton, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed Mar. 26, 1982, Ser. No. 362,288
Int. Cl.³ F16L *19/08*
U.S. Cl. 285—340 **1 Claim**



1. In a coupling assembly, first and second tubular fluid passage-defining structures, means for relatively drawing said structures axially together to assemble said structures in coupled relation to each other, a first formation forming a part of said first structure, a second formation forming a part of said second structure and cooperating with said first formation to define a cavity between said structures, said cavity extending circumferentially around the longitudinal axes of said structures and being disposed radially outwardly from the fluid flow passages through said structures, said first formation being formed with a first axially extending tubular end portion having a radially inwardly facing cylindrical surface delimiting said cavity, said second formation being formed with a second axially extending tubular end portion disposed radially inwardly of said first tubular end portion and having a radially outwardly facing cylindrical surface delimiting said cavity, said second tubular end portion being spaced from and unsupported by said first structure, said radially inwardly facing and radially outwardly facing cylindrical surfaces being radially spaced apart and axially overlapping each other when said structures are axially drawn together, said first formation being further formed with a circumferentially extending surface lying in a conical envelope and intersecting said radially inwardly facing cylindrical surface to define an inwardly opening circumferentially extending corner delimiting said cavity, said second formation being further formed with a circumferentially extending surface lying in a conical envelope and intersecting said radially outwardly facing cylindrical surface to define an outwardly opening circumferentially extending corner delimiting said cavity, said inwardly and outwardly opening corners being in diagonally opposed relation to each other, first and second interchangeable, equally sized torsionally deflectable seal rings received in said cavity, each of said seal rings having a pair of diagonally opposite corner edges and being torsionally deflectable about its cross section from a straightened configuration to a conical configuration in which it establishes a seal between said structures, said first and second formations engaging said seal rings to axially urge said seal rings into abutment with each other and to thereafter torsionally deflect each of said seal rings about its cross section to its conical configuration as said structures are axially drawn together to increase the radial dimension of each of said seal rings

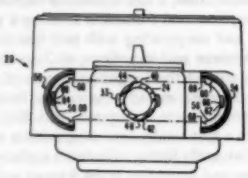
through its cross section for radially compressively loading each of said seal rings at its diagonally opposite corner edges and thereby establishing seals at the lines of contact between the diagonally opposite corner edges of each of said seal rings and said formations, said first seal ring having one of its diagonally opposite corner edges seated in said inwardly facing corner and the other of its diagonally opposite corner edges seating against said radially outwardly facing cylindrical surface in its torsionally deflected, seal-establishing condition, and said second seal ring having one of its diagonally opposite corner edges seated in said outwardly opening corner and the other of its corner edges seating against said radially inwardly facing cyindrical surface in its torsionally deflected, seal-establishing condition, the torsional deflection of said seal rings being initialized by engagement of only one of said corners with the assembly of said first and second seal rings, whereby only one of said corners is utilized to initialize torsional deflection of both of said seal rings, the deflected conical configuration of each of said seal rings lying along a conical envelope whose apex angle decreases as the seal ring is deflected from a relaxed condition to its torsionally deflected, seal-establishing condition, and stop abutment surface means limiting axial displacement of said first and second formations toward each other to limit the extent to which said seal rings are torsionally deflected by said first and second formations.

4,478,440

THREADED PIPE COUPLING

Ronald N. Koch, Allison Park, and David A. Yanov, Monroeville, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 1, 1982, Ser. No. 364,366
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—392 **9 Claims**



1. Connecting means for a pipe comprised of two identical semi-circular extending threaded connector members adapted to be removably received around the end of a pipe to form a threaded sleeve adjacent the end of the pipe, cooperating means formed on said connector members and said pipe adjacent the end of said pipe to permit mounting of said members on said pipe in only one mode of orientation with respect to each other.

4,478,441

VEHICLE BODY CLOSURE LATCH

Stephen J. Fiordellisi, Warren; Bela Gergoe, Birmingham, and John W. Hamilton, Dearborn, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

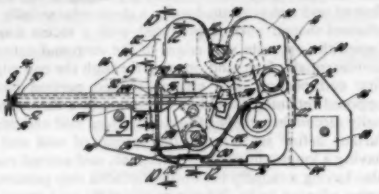
Filed Sep. 27, 1982, Ser. No. 424,467
Int. Cl.³ E05C *3/26, 13/04*
U.S. Cl. 292—216 **3 Claims**

1. In a vehicle body, a closure latch having a latch bolt and a detent movable to released position with respect to the latch bolt, a remote release arrangement for moving the detent to the released position, comprising, in combination,

an auxiliary release lever movably mounted on the closure latch and including an abutment engageable with the detent to move the detent to released position,

first and second individually actuated manual operators mounted on the vehicle,

first and second cables respectively extending from the first and second operators to the release lever, each cable slidably extending through the release lever and including an abutment thereon engageable with the release lever upon actuation of its respective operator to move the



release lever relative to the other cable and engage the release lever abutment with the detent to move the detent to released position,

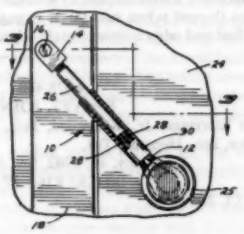
and a cable housing extending between each operator and the release lever for housing a respective cable.

4,478,442

SAFETY LOCK ON ENTRANCE DOOR

Edward J. Martin, 5921 Oliver Ave. South, Minneapolis, Minn. 55419

Continuation-in-part of Ser. No. 286,566, Jul. 24, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,246
Int. Cl.³ E05C *17/36*
U.S. Cl. 292—248 **12 Claims**



1. A safety lock for a knob operated door mounted in a door frame including a framing stud, said safety lock including:

an anchor block having a lag screw receiving opening therethrough;

a flexible cable loop having a pair of parallel end portions permanently mounted in the anchor block;

a cylindrical shank tightly encompassing the loopend portions in adjacent relation to the anchor block;

a cylindrical sleeve in encompassing, rotating and longitudinal sliding relation to said shank; and

a lag screw extending through said provided opening in said anchor block and into said framing stud in position to permit said cable loop to fit over a knob on said door when said sleeve is positioned adjacent said anchor block and to prevent said loop from being removed from said doorknob when said sleeve is moved close to the limit of its movement toward said knob.

4,478,443

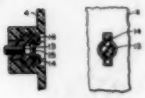
POSTAGE METER SECURITY SEAL

Timothy R. Erwin, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 28, 1982, Ser. No. 437,423
Int. Cl.³ B65D *55/06*
U.S. Cl. 292—307 R **16 Claims**

1. A security sealing means for locking the housing of a

postage meter, the housing including a housing panel having an aperture, the security sealing means comprising: an insert adapted to fit into and mate with the aperture of the housing



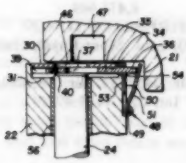
panel of the postage meter the insert having a screw bore adjusted to receive a screw and having breakable tabs adapted to be melted over the head of the screw.

4,478,444

DOOR BOLT IMMOBILIZING DEVICE

John L. Kurz, McConnellsburg, and Harry F. Harshbarger, Robertsdale, both of Pa., assignors to JGR Enterprises, Inc., Fort Littleton, Pa.

Filed Nov. 30, 1982, Ser. No. 445,553
Int. Cl.³ E05C *9/06*
U.S. Cl. 292—333 **13 Claims**



1. An immobilizing device for a door bolt in the retracted position of the bolt comprising a body portion fixed to one edge portion of a door having a bolt operable on an axis across said edge portion at right angles thereto, said body portion having a guideway across the axis of the bolt at right angles thereto adjacent to the end face of the bolt when the bolt is in the retracted position, a bolt blocking plate movably engaged in said guideway and shiftable therein across the axis of the bolt between bolt blocking and bolt release positions, means engaged between the body portion and the blocking plate to yieldingly bias said blocking plate to the bolt blocking position, and an operator for the blocking plate on one face of the door comprising a first leaf fixed to one vertical face of the door at right angles to said door edge portion, a second movable actuator leaf for the blocking plate hingedly connected to the first leaf and engaging an end extension of the blocking plate away from the biasing means and being in opposed relationship to a door jamb stop surface, said first leaf having a passage through which the end extension of the blocking plate extends movably, whereby closing of the door carrying the bolt immobilizing device automatically shifts the bolt blocking plate to the bolt release position against the force of the biasing means.

4,478,445

DOOR HANDLE ASSEMBLY

Keiichi Shimizu, Tokyo, Japan, assignor to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,930
Int. Cl.³ E05C *13/04*
U.S. Cl. 292—336.3 **2 Claims**

1. An outside door handle assemby comprising:

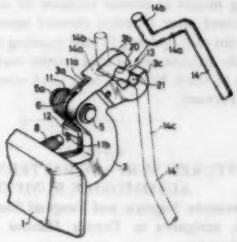
a door handle arm made of a plastic resin material and mounted on a door of an automotive vehicle,

a channel-shaped metal bracket fixedly attached to said door handle arm,

a pair of finger projections made integral with the said door handle arm,

a return coil spring mounted on one of said finger projections for resiliently urging said handle arm towards its upper, non-service regular position,

a pair of pivot pins mounted on said finger projections, one



of the said pivot pins mounting the said return coil spring, while the other of the said pivot pins bears no such return coil spring,

a pair of half round bearing recesses formed on two finger elements extending from said finger projection that mounts the return coil spring, for providing a pair of axially staggered bearing halves that face in opposite directions,

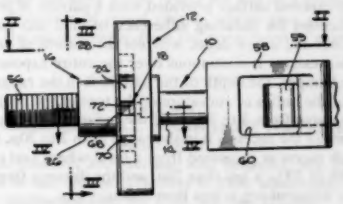
a door latch operation rod having a Z-shaped rod end, the middle portion of said Z being pivotably mounted on the said spaced, opposed bearing halves, respectively.

4,478,446

ADJUSTABLE KEEPER ASSEMBLY

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Division of Ser. No. 104,176, Dec. 17, 1979,. This application Mar. 7, 1982, Ser. No. 375,878
Int. Cl.³ E05B *15/02*
U.S. Cl. 292—341.18 **8 Claims**



1. An adjustable keeper assembly adapted for mounting on a support structure and engaging a latch element, said assembly being engagable by an external tool for adjusting the same, said keeper assembly comprising:

a housing having an opening therein adapted to receive said tool therein;

mounting means for securing said housing to said support structure;

a movable keeper member disposed in said housing and having mounting means at one end for coupling said member to a support structure and latch engaging means at the other end for releasable engagement to a latch element;

adjustment means comprising a rotatable wheel having a plurality of spaced radially extending slots therein for drawing up said keeper member with respect to both said

support structure and said latch element thereby taking up slack therebetween, rotation of said wheel orienting selective ones of said slots in said wheel with said opening in said housing thereby allowing a tool to be inserted into said opening in said housing and into engagement with selective ones of said slots in said wheel to thereby rotate the same; and

locking means movable between a wheel engaging and a wheel disengaging position entering said opening in said housing and into a position engaging said selective ones of said slots and adapted to be engaged by a tool entering said opening in said housing to thereby disengage said locking means to permit rotation of said wheel and lock said wheel after rotation thereof upon withdrawal of a tool from said opening in said housing thereby preventing movable adjustment of said keeper member after the taking up of slack between said latch element and said support structure.

4,478,447

TEXTURED SURFACE PATTERN FOR AN AUTOMOBILE BUMPER

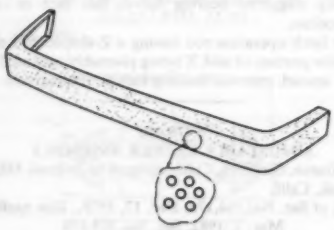
Yoshiro Umemoto, Nagoya, and Tsugumi Sanmiya, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1982, Ser. No. 454,011

Claims priority, application Japan, Dec. 28, 1981, 56-197900[U]

Int. Cl.³ B60R *19/10*

U.S. Cl. 293—102 **7 Claims**



1. An automobile bumper made of synthetic resin comprising an exposed surface provided with a pattern of projections and recesses for reducing adherence of mud and visibility of scratches and minor dents, wherein the pattern of projections and depressions is continuous over the entire exposed surface of the bumper, the depth of the pattern is in the range from 20 to 70μ, the radius of curvature of the tops of the projections is in the range from 3 to 30μ, and the radius of curvature of the bottoms of the recesses is in the range from 2 to 30μ, the depth of each recess as measured from a level where said recess has a width of 200μ is less than 20μ, and the distance from one top of any adjacent top is less than 2500μ.

4,478,448

ANIMAL EXCREMENT REMOVAL DEVICE

Karmen D. Albert, 74-16 58th Ave., Elmhurst, N.Y. 11373

Filed Jun. 7, 1982, Ser. No. 385,812

Int. Cl.³ A01K *29/00*; A47L *5/04*

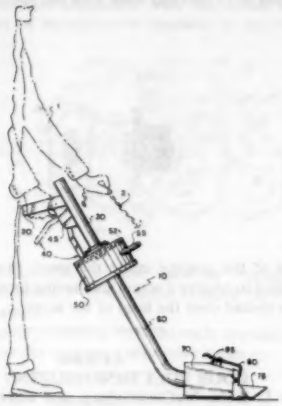
U.S. Cl. 294—1 BA **8 Claims**

1. A portable animal excrement removal device comprising, in combination:

an excrement containing housing adapted to receive and retain excrement;

piston means adapted to generate sufficent suction to draw excrement into said excrement containing housing;

priming means adapted to cock said piston means in a loaded position, said priming means including a priming lever having a handle and pinion gear adapted to engage a rack gear on said piston rod; and



release means adapted to release said piston means from its loaded position and generate suction in said excrement containing housing.

4,478,449

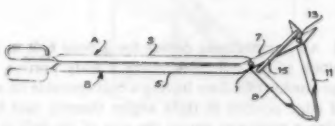
FIREPLACE TONGS

Claude Bernier, 1203, boul. Mont-Royal, Outremont, Quebec, Canada H2V 2H7

Filed Jan. 24, 1983, Ser. No. 460,285

Int. Cl.³ A47J *49/14*

U.S. Cl. 294—10 **2 Claims**



1. Fireplace tongs for particular use in handling fire logs, comprising:

a pair of levers connected together intermediate their respective ends by means of a first pivot in the manner of scissors, this first pivot defining on one side thereof operating arms and on the other side thereof extensions of said operating arms, one of said extensions constituting a first jaw for said tongs;

a second jaw similar to said first jaw;

a second pivot mounting one end of said second jaw at the end of the other of said extensions away from said first pivot; and

a connecting link of which the ends are pivotally mounted on said jaws, respectively on one side and on the other side of said other extension and adjacent to said pivots;

wherein said extensions are bent relative to their respective operating arm outwardly in a direction away from one another,

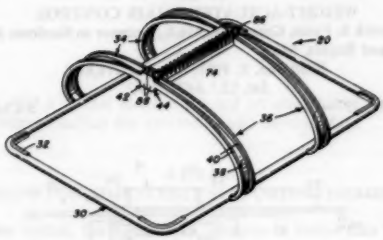
wherein the end of said other extension and the end of said second jaw adjacent to said second pivot are pointed; said pointed ends being intended to serve as a poker when said tongs are completely closed; and whereby closing in of said operating arms causes tightening of said jaws and spreading apart of said operating arms causes loosening of said jaws.

4,478,450

CARRIER WITH HANDLE FOR CONTAINERS OR THE LIKE

Augusto A. Picozza, Johnston, R.I., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Jul. 6, 1982, Ser. No. 395,165
Int. Cl.³ A47J 45/07; B65D 25/28
U.S. Cl. 294—31.2 13 Claims



1. A carrier for use in the releasable support of a container, said carrier comprising:

a container receiving frame;

first flexible strap means fixed to said frame and extending therefrom to a free end;

second flexible strap means fixed to said frame generally opposed to said first strap means and extending to a free end;

first and second elongate handle elements respectively fixed to the free ends of the first and second strap means, each of said handle elements extending transversely of the corresponding strap means end, each of said handle elements including

an elongate rigid body having a first elongate side with first and second opposed edges, and a second elongate side extending from the second of said edges approximately perpendicularly to said first body side,

an elongate panel with first and second sides, said panel projecting generally perpendicularly from said first body side in inwardly spaced relation to said first body edge to define a shoulder between the panel and said first body edge,

recess defining means laterally to the first panel side comprising an elongate lip extending laterally outward of the second side of the elongate body, said lip including an outer portion generally paralleling said second body side in outwardly spaced relation thereto, said outer portion terminating in an outer edge generally coplanar with said shoulder, said means defining a recess of a size to receive and nest therein the panel of the other handle element whereby said handle elements are adapted for releasable engagement with the panel of each element received within the recess of the other element and said shoulder in seated engagement on the shoulder of the other element;

cooperating releasable lock means on each panel and each recess defining means for releasably locking each panel within the recess receiving this panel;

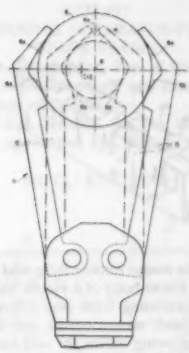
multiple spaced pairs of rigidifying ribs integral with each panel, the ribs of each pair projecting from the opposed sides of said panel.

4,478,451

MECHANICALLY OPERATED TONGS FOR GRIPPING ROUND OBJECTS

Eberhard Brücher, and Karl-Heinz Schüssler, both of Siegen, Fed. Rep. of Germany, assignors to Dango & Dienenthal Maschinenbau GmbH, Siegen, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,342
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123897
Int. Cl.³ B25J 15/00; B66C 1/42
U.S. Cl. 294—106 2 Claims



1. Mechanically operated tongs for gripping round objects, comprising a pair of tong arms, means mounting each tong arm for pivotal movement toward and away from the other tong arm about a pivot point, the ends of the tong arms having each two engaging surfaces forming an obtuse angle with each other, the engaging surface farthest from the pivot point of each tong arm being concave and the engaging surface lying closest to the pivot point of each tong arm being convex, said surfaces being so configured that a line extending between the points of contact of said concave surfaces will be spaced from the center of said round object substantially the same distance as a line interconnecting the points of contact of said convex surfaces with the same round object for any of a plurality of different diameters of round objects whose axes are all disposed at the same distance from the pivot point of each tong arm.

4,478,452

CARRIER APPARATUS AND HOSE FOR FIRE FIGHTERS

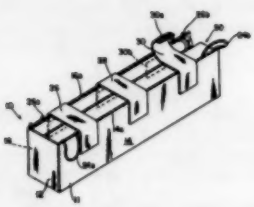
Robert M. Clemens, 3709 Sellman Rd., Beltsville, Md. 20705

Division of Ser. No. 147,211, May 6, 1980, abandoned. This application Dec. 30, 1980, Ser. No. 221,388
Int. Cl.³ B65D 71/00
U.S. Cl. 294—141 4 Claims

1. Carrier apparatus for use by fire fighters for carrying hose to a fire site as a package of a size to contain a substantial length of fire hose and of a weight which may be carried by a single fire fighter, and for use as a person carrier to support a supine adult victim for rescue by dragging by a single fire fighter or for lifting by plural fire fighters, comprising, an elongate, flaccid carrier body made of flaccid material, and having a length approximately equal to the distance from the head to the calf of an adult, said carrier body having an elongate bottom, a single end wall and a pair of spaced side wall means for cradling the head of a victim there between, said single end wall being at an end of and substantially perpendicular to said bottom, said carrier body having an open end opposite said single end wall, said side wall means extending from said single

end wall, and being subtantially perpendicular to said end wall at their junctions therewith, said side wall means extending from said end wall in the same direction as said bottom, and being spaced apart approximately the width of a heat at said end wall, said side wall means each having a longitudinally extending edge remote from said bottom, and extending from said edge to said bottom, handle means on each of said side wall means for lifting said carrier body and a load supported thereby, and comprising:

(a) first handle means adjacent said end wall for lifting the head and upper body portion of the victim on said carrier body and for causing said side wall means to cradle the head of a victim therebetween, and



(b) second handle means remote from said first handle means for lifting the lower body of a victim on said carrier body, strap means extending from one side wall means to the other side wall means across the edge thereof, and releasable securing means for said strap means, and

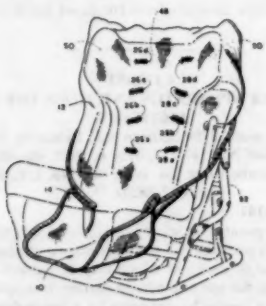
at least one stack of fire hose in said carrier body with an end thereof adjacent the open end of said carrier body, whereby said fire hose may be readily withdrawn from said carrier body, and whereby an adult victim may be dragged or carried on said carrier body, with the victim's head adjacent said end wall, supported on said bottom, and cradled between said side wall means.

4,478,453

ADJUSTABLE COVER FOR INFANT CAR SEAT

Bernard R. Schutz, New York, N.Y., assignor to Fine Art Pillow & Specialties Corp., New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,366
Int. Cl.³ A47C *31/10*
U.S. Cl. 297—219 **7 Claims**



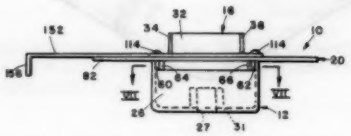
1. A cover for use with infant car seats of a range of different dimensions of the type having a substantially upstanding back, the cover comprising front and rear sections joined along the top thereof to form a recess into which at least the upper part of said seat back is adapted to be received, said rear section having spaced first portions, defining, in part, the respective ends of said recess, each of said first portions including means for altering the effective size and shape of one of said recess ends, a second portion extending between said first portions in a direction across the back of the seat and including means thereon for altering the effective length of said second portion in said direction, and elastic means, situated along the edge of at least a part of said rear section, for permitting expansion of said recess and for maintaining said edge adjacent the back of said seat.

4,478,454

WEIGHT-ACTUATED CHAIR CONTROL

Frederick S. Falks, Greenville, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 8, 1981, Ser. No. 271,662
Int. Cl.³ A47C *1/02*
U.S. Cl. 297—316 **5 Claims**



1. A chair control which permits independent adjustment of the seat and back angles comprising:

a housing including means for receiving a chair base;

means for supporting a chair back;

first means pivotally mounting said chair back support means to said housing for permitting said chair back to tilt;

a front link;

second means pivotally mounting said front link to said housing;

an intermediate link;

third means pivotally mounting said intermediate link to said chair back support means, said third pivotal mounting means located upwardly from said first pivotal mounting means;

means for supporting a chair seat;

fourth means pivotally mounting said chair seat support means to said front link, said fourth pivotal mounting means located rearwardly and downwardly from said second pivotal mounting means;

fifth means pivotally mounting said chair seat support means to said intermediate link, whereby said chair seat can tilt independently of said chair back; and

locking means for selectively maintaining said chair seat support means in fixed relation to said stationary housing.

4,478,455

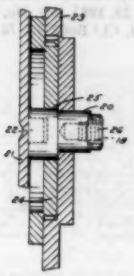
HOLLOW ECCENTRIC BOLT FOR TAUMEL HINGE FITTING

Peter W. Linde, Battle Creek, Mich., assignor to Keiper U.S.A., Inc., Battle Creek, Mich.

Filed Apr. 26, 1982, Ser. No. 371,820
Int. Cl.³ A47C *1/025*
U.S. Cl. 297—362 **8 Claims**

1. In combination a backing plate having a male cylindrical projection, a taumel eccentric bolt comprising a body having external eccentric cylindrical surfaces with parallel offset axes,

an internal cylindrical bearing surface in said bolt coaxial with one of said external cylindrical surfaces engaging said projec-



tion, and a taumel element pivoted on said coaxial external cylindrical surface and secured to said backing plate.

4,478,456

MEANS FOR ADJUSTABLY SUPPORTING HEADREST OF AUTOMOTIVE SEAT

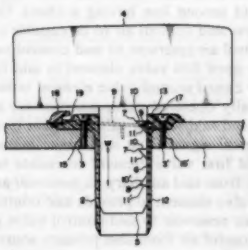
Hideo Mitsui, Fuchushi, Japan, assignor to Tokyo Seat Kabushiki-Kaisha, Asakashi, Japan

Filed Jul. 22, 1981, Ser. No. 285,856

Claims priority, application Japan, Jul. 25, 1980, 55-105784[U]

Int. Cl.³ A47C 1/10

U.S. Cl. 297—410 **1 Claim**



1. Means for removably connecting and vertically adjustably supporting a head rest to an automotive seat which comprises:

a vertically extending hollow member provided with a slot opening and a flange which extends transversely to and outwardly from an upper part of said hollow member, the lower part of the member being within the automotive seat and the flange being mounted substantially over the upper end of the automotive seat;

a base member provided to the headrest and slidably received by the vertically extending hollow member, the base member having a row of recesses along the longitudinal axis thereof and with predetermined distances therebetween and each of the recesses having a surface of a right angle with respect to the said longitudinal axis, the lowermost recess of the base member having a lower surface of a right angle with respect to the longitudinal axis thereof, and other recesses having upper surfaces of a right angle with respect to the longitudinal axis;

detent means of a U-shape operable to resiliently engage with the selected one of the recesses, and provided with a base portion and bifurcations extending from said base portion, said base portion abutting against the one of the recesses through the aforementioned slot opening of the hollow member and said bifurcations extending outwardly from the hollow member, closely under the flange of said hollow member, and transversely to the longitudinal axis of the hollow member;

spring means removably accommodated to the flange of said hollow member and resiliently biasing the detent means toward the base member of the headrest, and pushing means removably supported by the flange of the hollow member and having bifurcations, the ends of which abut against the bifurcations of the detent means and operable when actuated to disconnect the engagement of the base portion of the detent means with the base member of the headrest.

4,478,457

LONGWALL MINING APPARATUS FOR WORKING THICK SEAMS

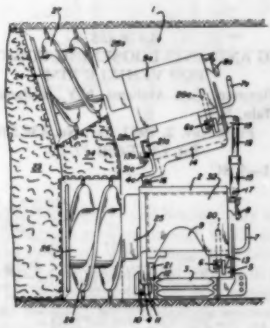
Willy Lanfermann, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 489,716

Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218495

Int. Cl.³ E21C 25/16

U.S. Cl. 299—18 **8 Claims**



1. A longwall mining machine which travels over a face conveyor having a first toothed rack extending therealong, comprising a gantry-like frame movable along said face conveyor, said gantry-like frame having upstanding supports at its opposite ends which carry an upper track and a second toothed rack, a first mining machine frame carried on said face conveyor and having drive pinion means engageable with said first toothed rack, a second mining machine frame carried on said upper track on the gantry-like frame and having drive pinion means engageable with said second toothed rack, said second mining machine frame being reciprocable along said upper track independently of said first mining machine frame, said first and second mining machine frames each having a shearer drum mounted thereon for cutting and removing a mineral seam, and means for selectively securing said first and second mining machine frames to said gantry-like frame, the arrangement being such that when the first and second machines are secured to the gantry-like frame, the entire gantry-like frame and both mining machine frames will traverse said face conveyor upon rotation of the drive pinion means on the first mining machine.

8. A method for operating longwall mining machine apparatus of the type having a gantry-like frame movable along the machine track of a face conveyor, said gantry-like frame carrying an upper second machine track, and upper and lower mining machines carried on said upper second machine track and said face conveyor machine track respectively, with each of said mining machines being provided with a shearer drum carried on a pivotal arm, said method comprising:

securing said gantry-like frame to said face conveyor,

moving said upper and lower mining machines to opposite ends of said gantry-like frame and positioning said shearer drums on their pivotal arms at positions where the upper pivotal arm is inclined upwardly and toward one end of the gantry-like frame while the lower pivotal arm is inclined downwardly and toward the other end of the gantry-like frame,

securing said upper and lower mining machines to said gantry-like frame,

releasing the gantry-like frame from said face conveyor and causing said lower mining machine to traverse the face conveyor while carrying said gantry-like frame and said upper mining machine therewith while said shearer drums cut and remove material from a face being mined, and

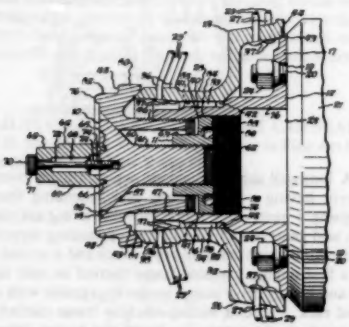
when said gantry-like frame reaches the end of a face area being mined, again securing said gantry-like frame to said face conveyor while causing said lower mining machine to traverse the gantry-like frame to a position where it is directly below the upper mining machine.

4,478,458

LOCKING AND ANTI-LOOSENING CONSTRUCTION FOR VEHICLE RIM

C. Hight Flexman, East Amherst, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed Nov. 2, 1982, Ser. No. 438,589
Int. Cl.³ B60B *27/00*
U.S. Cl. 301—9 SC **16 Claims**



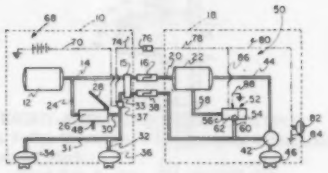
1. In a rim mounting construction having a hub mounting shaft with an internal surface, attachment means on said hub mounting shaft for mounting said hub mounting shaft on rim mounting lugs of an axle, a rim having a hub for mounting on said hub mounting shaft, a hub securing member, a shoulder on said hub securing member, and first thread means between said hub securing member and said hub mounting shaft for attaching said hub securing member to said hub mounting shaft with said shoulder bearing against said hub to thereby secure said hub on said hub mounting shaft, the improvement comprising a locking nut, securing means for securing said locking nut within said internal surface of said hub mounting shaft, a locking bolt having a shank and a bolt head, first and second surfaces on said bolt head and said hub securing member, respectively, and second thread means between said shank and said locking nut for drawing said first surface into frictional abutting engagement with said second surface after said first thread means have been tightened to cause said shoulder to bear against said hub and for preventing said hub securing member from being unthreaded from said hub at said first thread means.

4,478,459

TRAILER BRAKING SYSTEM

James C. Cumming, Pleasant Ridge, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1983, Ser. No. 468,833
Int. Cl.³ B60T *13/74*
U.S. Cl. 303—7 **4 Claims**



1. An improved braking system for a trailer of the type which includes a primary air reservoir on a tractor, an auxiliary air reservoir on said trailer which is supplied by said primary air reservoir, brake actuation means on said tractor to selectively provide control air from a primary source on said tractor to a control valve on said trailer, and said control air causing said control valve to direct air from said auxiliary air reservoir to braking means on said trailer, wherein said improvement comprises:

a secondary source of said control air on said trailer including a control air reservoir having a volume significantly smaller than a volume of said,auxiliary air reservoir;

said controlled air reservoir being supplied said control air through a first line from said auxiliary air reservoir;

a second line from said control air reservoir to said control valve said second line having a check valve therein to only allow said control air to be capable of passing from said control air reservoir to said control valve;

a normally open first valve element in said first line;

a normally closed second valve element in said second line;

an electrically operated valve actuator for said first valve element and said second valve element being actuated by an electrical signal from said brake actuation means to close said first valve element to isolate said control air reservoir from said auxiliary air reservoir and to open said second valve element to provide said control air from said control air reservoir to said control valve prior to arrival of said control air from said primary source; and

said electrically operated valve actuator including a solenoid coil and a core which is mounted for axial movement within said coil between a first position and a second position, said core being normally biased to said first position to open said first valve element and closed said second valve element, said core being moved to said second position by said electrical signal in said solenoid coil to close said first valve element and open said second valve element.

4,478,460

INTERLOCK VALVE FOR RAILWAY BRAKING SYSTEM VALVE ASSEMBLY

David J. Wickham, Chippenham, England, assignor to Westinghouse Brake and Signal Co. Ltd., Chippenham, England

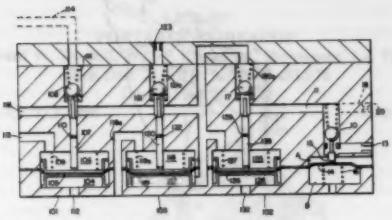
Filed Sep. 8, 1982, Ser. No. 416,074
Claims priority, application United Kingdom, Sep. 11, 1981, 8127544
Int. Cl.³ B60T *15/02*
U.S. Cl. 303—68 **4 Claims**

1. A valve assembly for a pneumatically operated railway braking system of the kind in which a drop in brake pipe pressure, calling for brake application, initiates a pilot pressure and this pilot pressure is used to operate other valves pneumatically to effect braking, the assembly including:

a brake release valve,

a source of pilot pressure air,

means for connecting the source of pilot pressure air to the release valve so as to operate the valve to release the brakes in two stages, an initial stage and a final stage,



a pilot pressure air exhaust choke to choke the flow of pilot pressure leaving the exhaust valve, and

means for isolating the pilot pressure air exhaust choke so as to prevent the flow of pilot pressure air to atmosphere during at least the initial part of the brake application.

4,478,461

HYDRAULIC DUAL-CIRCUIT SERVO BRAKE APPARATUS

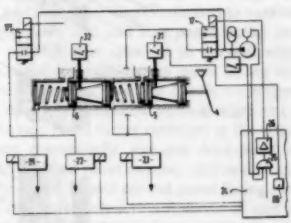
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 411,139

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145323

Int. Cl.³ B60T *17/18*

U.S. Cl. 303—92 **15 Claims**



1. A hydraulic dual-circuit servo brake apparatus having a dual circuit main cylinder equipped with two separate pistons, a pressurizing device and a control valve intended for directing the pressure medium of the pressurizing device into the brake circuits, characterized in that said control valve is a magnetic valve which is triggerable in accordance with the position of the main cylinder pistons, and an electronic switching device for monitoring triggering of said control valve.

4,478,462

LINEAR BALL BEARING UNIT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed May 16, 1983, Ser. No. 494,880

Claims priority, application Japan, May 20, 1982, 57-85436

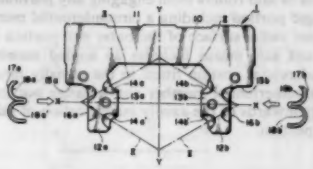
Int. Cl.³ F16C *29/06*

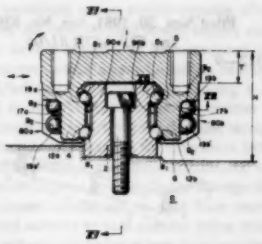
U.S. Cl. 308—6 C **7 Claims**

1. A linear ball bearing unit comprising:

a bearing body having a pair of skirts provided on their opposing surfaces with longitudinal ribs, said bearing body further having ball rolling grooves formed in both side surfaces of said ribs and constituting parts of passageways for loaded balls, longitudinal recesses formed in the outer surfaces of said skirts, and channel members fitted in respective recesses, said recesses and channel members in combination constituting passageways for non-loaded balls;

a track shaft provided in both side surfaces thereof with recesses for receiving said ribs on said bearing body, said recesses being provided in both side walls thereof with ball rolling grooves constituting parts of said passageways for loaded balls; and





lids attached to both ends of said bearing body and adapted to provide ball turn grooves through which said passageways for loaded balls are connected to corresponding passageways for non-loaded balls thereby to permit ball trains to be recirculated through said passageways for loaded ball and then through said passageways for said non-loaded balls.

4,478,463

CONICAL ROLLER BEARING

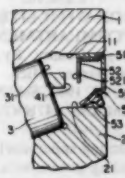
Toru Takai, Fijisawa; Kenji Takei, Hiratsuka, and Youichi Nagano, Chigasaki, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha

Filed Dec. 13, 1982, Ser. No. 449,278

Claims priority, application Japan, Dec. 25, 1981, 56-192792; Dec. 25, 1981, 56-192793; Jan. 28, 1982, 57-9370

Int. Cl.³ F16C *33/76*

U.S. Cl. 384—482 **5 Claims**



1. In a conical roller bearing having an outer race and an inner race spaced radially and defining tapered bearing surfaces spaced further apart at the axially outer end portion of said bearing surfaces, a plurality of rollers held between said inner race and said outer race, a retainer holding said rollers, and a seal fitted between the axially outer end portions of said outer race and said inner race, said seal having a rigid portion

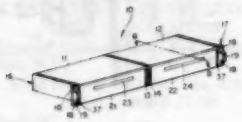
fitted to the axially outer portion of said outer race and an elastomeric portion positioned adjacent said inner race, the improvement wherein said retainer includes an outer portion extending axially outwards from said rollers and said rigid portion includes means extending radially inwards from said outer race at a position adapted to engage the adjacent outer portion of said retainer as said retainer shifts axially outwards relative said outer race for preventing the axially outer end surfaces of said rollers from engaging any portions of said seal, said rigid portion including a circumferential member fixed to the inner radial surface of the outer end portion of said outer race, and said means includes an angled member having a circumferential portion fitted to the radially inner surface of said circumerfential member and a flange portion depending radially inwards of the axially inner portion of said circumferential portion.

4,478,464

RACK-MOUNTABLE STORAGE ENCLOSURE FOR DIFFERENTLY SIZED MAGNETIC TAPE ENCLOSURES

Jerry B. Williams, 4900 Wetheredsville Rd., Baltimore, Md. 21207

Filed Nov. 30, 1981, Ser. No. 325,654
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—9 **7 Claims**



1. A rack-mountable tape cartridge enclosure device for storing multi-sized cartridges, comprising:

(a) an enclosure having a generally box-like shape;

(b) means therein for storing said cartridges in a parallel arrangement, including a plurality of dividers contoured to handle a plurality of cartridge sizes;

(c) interlocking means for securing said enclosure to a second such enclosure on either side thereof, said interlocking means being fixed relative to said enclosure, integral with a side thereof, and adapted to interlock with corresponding means on said second enclosure;

(d) a plurality of mounting members detachably secured to the sides of said enclosure, said members each having a flange substantially parallel to the front of said enclosure, said flanges having apertures therein to facilitate attachment to a standard equipment rack.

4,478,465

COMPACTOR DOOR WITH LITERATURE STORAGE COMPARTMENT

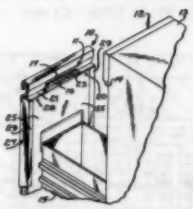
Charles E. Sulcek, Boyle County, Ky., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 30, 1982, Ser. No. 429,842
Int. Cl.³ A47B *41/06*
U.S. Cl. 312—183 **17 Claims**

1. In a refuse compacting apparatus having a generally vertical closure for providing access to a refuse receptacle, said closure defining a bottom and an upper portion and having a handle fixed to and extending horizontally across said upper portion thereof, the improvement comprising:

means on said handle defining a slot opening downwardly into a generally vertical internal space defined by said closure; and

means in said door defining a raised pocket means spaced below said slot and above said closure bottom for removably supporting sheet material inserted downwardly into said space through said slot, said pocket defining a bottom support for the material in said pocket means positioned to cause a top portion of the inserted sheet material to be



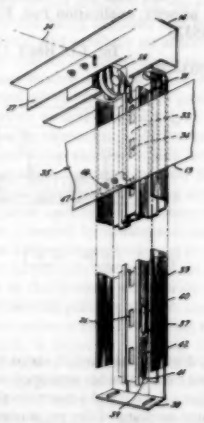
disposed to be accessible at said slot for grasping of the sheet material by a user to permit selective removal of the sheet material from the pocket means as desired.

4,478,466

LOCKABLE STORAGE SYSTEM

Leonard R. Clark, Oreland, and David W. Meehl, Hatboro, both of Pa., assignors to SPS Technologies, Inc., Newtown, Pa.

Filed May 12, 1982, Ser. No. 377,276
Int. Cl.³ E05C *15/04*
U.S. Cl. 312—215 **2 Claims**



1. A storage system comprising: support means;

a plurality of shelves mounted in said support means;

a plurality of drawers slidably mounted in said support means, each drawer having a member mounted thereon; and

adjustable locking means mounted on said support means and formed to be engageable with said drawer members for locking said drawers individually or in concert, said adjustable locking means comprising:

a locking channel housing mounted in said support means, comprising a first housing member, a second housing member, slidable within said first housing member for adjusting the length of said locking channel housing, and fastener means for restraining said first housing member within said second housing member;

a locking channel slidably mounted in said locking channel housing, having a plurality of slots therein for operatively engaging said members on said drawers;

means for moving said locking channel vertically; and

biasing means for positioning said locking channel into a

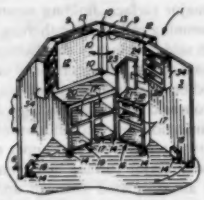
locked position whereby said members on said drawers extend through said openings in said locking channel and are engaged to lock said drawers by restricting their movement.

4,478,467

PORTABLE WORKSHOP

Howard W. Tyndall, 2923 E. Cavett St., Shreveport, La. 71104

Filed Dec. 27, 1982, Ser. No. 453,876
Int. Cl.³ A47B *43/00*
U.S. Cl. 312—250 **4 Claims**



1. A portable workshop comprising:

(a) a pair of rear panels having substantially parallel edges in adjacent relationship, a first panel facing member rigidly attached to one of said rear panels and a second panel facing member rigidly attached to the other of said rear panels, a door panel positioned adjacent said first panel facing member and a closure panel positioned adjacent said second panel facing member;

(b) rear panel hinges joining said parallel edges of said rear panels, and first panel hinges attached to vertical edges of said door panel and said first panel facing member and second panel hinges attached to vertical edges of said closure panel and said second panel facing member, respectively, whereby said rear panels are hingedly joined to each other along adjacent vertical edges and are fixedly joined to said panel facing members at the opposite vertical edges, respectively, and said door-panel is hingedly joined to said first panel member, and said closure panel is hingedly joined to said second panel facing member;

(c) a first cabinet attached to a first one of said rear panels and having a first generally horizontally-disposed cabinet top for use as a work space and first compartments for storing tools and supplies;

(d) a second cabinet attached to a second one of said rear panels in spaced relationship to said first cabinet and having a second generally horizontally-disposed cabinet top in substantial alignment with said first cabinet top for use as a work space and second compartment for storing tools and supplies;

(e) a pair of pegboards mounted on said rear panels above said first cabinet and said second cabinet, respectively;

(f) counter means hingedly attached to said first cabinet and foldable on said first cabinet top to bridge the space between said first cabinet top and said second cabinet top and counter segment means hingedly carried by said counter means along one edge of said counter means adjacent said one of said rear panels and foldable on said counter means to facilitate folding of said counter means past said pegboard from said first cabinet top to said second cabinet top; and

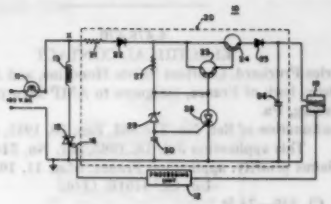
(g) cabinet spacer means having one end pivotally attached to said first cabinet and pivotally disposed to extend between said first cabinet and said second cabinet, whereby said first cabinet is properly spaced from said second cabinet when said portable workshop is in the open configuration.

4,478,468

LINE-GATED SWITCHING POWER SUPPLY

Erich W. Schoen, Glen Ellyn, and Lee D. Tice, Bartlett, both of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Aug. 27, 1982, Ser. No. 412,156
Int. Cl.³ G05F *1/00*; H05B *37/00*
U.S. Cl. 315—291 **7 Claims**



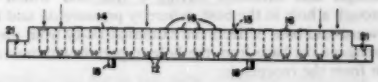
1. A line gated switching power supply capable of operation with an interrupted AC source, said power supply comprising a charge storage device adapted to be connected across an associated load, current value means including two transistors connected in a Darlington configuration having a collector terminal coupled to the AC source and an emitter terminal coupled to the charge storage device and a base terminal, said current valve means being adapted for operation between an open-circuit condition and a maximum-conduction condition for passing maximum current to said charge storage device for charging same, means connected to said base terminal for providing a control current to said current valve means sufficient to operate said current valve means in its maximum-conduction condition, and control means coupled to said current valve means and responsive when the voltage across said charge storage device exceeds a predetermined level for removing said control current from said current valve means thereby to cause said current valve means to shift to its open-circuit condition and terminate current flow to said charge storage device.

4,478,469

CARD KEYING DEVICE

Robert J. Waite, Huntington Beach, and Ronald P. Almeida, Yorba Linda, both of Calif., assignors to Zero Corporation, Burbank, Calif.

Filed May 17, 1982, Ser. No. 378,538
Int. Cl.³ H01R *13/64*
U.S. Cl. 339—17 LC **7 Claims**



1. A male-female keying device, comprising;

(a) a first elongated strip (1) having therein a plurality of wholly cylindrical holes therealong,

(b) pins (3) removably but firmly fitted into selected said holes in only said first elongated strip according to a selected position code,

said pins projecting from said holes,

(c) a pair of pins (5) fitted into substantially the extremities of said first strip and projecting farther from said strip than the removable pins, said pair of pins tapered to act as guides in assembling the device,

(d) a second elongated strip (14) having a plurality of wholly cylindrical holes (15) therealong that match the positions of said plurality of holes and accept with sliding fit the

pins (3) fitted into said selected holes and said pair of pins (5) in said first strip, and

(e) flush-fitting pins (16) in all such holes in said second strip as are not provided with projecting pins according to the selected code of said first strip upon assembly of said device

whereby only said first and second elongated strips that have the same code can be fitted together.

4,478,470

ELECTRICAL CONTACT

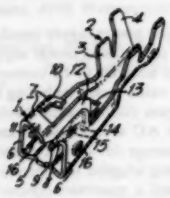
Charles Fruchard, Conflans Sainte Honorine, and Jean C. Joly, Osny, both of France, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 236,462, Feb. 20, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 514,365

Claims priority, application France, Mar. 11, 1980, 80 05409

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—74 R **2 Claims**



1. An electrical contact for mating with a flat tab male contact and comprising a receptacle portion for receiving a male tab and an opposed wire connection portion, the whole being stamped and formed from sheet metal, the receptacle portion comprising a base and a pair of opposed sidewalls upstanding from the base, free edge portions being formed inward from said sidewalls over the base, each said free edge portion having a free edge facing said base, said base, sidewalls and free edges defining a tab entry end and tab receiving passage, characterized in that one free edge portion serves a latching function and the other free edge portion serves an electrical contact function, said one free edge portion comprising an extension in a plane perpendicular to said base and projecting away from the tab entry end of the receptacle, said extension being connected to the respective sidewall by a resilient portion between the sidewall and the extension, said one free edge portion being cut to isolate a part thereof from said extension, said resilient portion remaining at the tab entry end of the receptacle, said free edge of said one free edge portion being on said extension and having a barb adapted to be received in a hole in the male tab for positive latching thereof in said passage, said extension having a free end which extends through a hole in the base, whereby pressure on said free end toward said base deflects the extension away from the base to disengage the barb from the hole to permit withdrawal of the tab from the receptacle.

4,478,471

ZERO INSERTION FORCE CONNECTOR HAVING IMPROVED CAMS

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

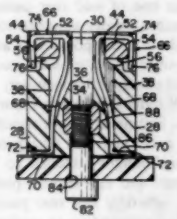
Continuation of Ser. No. 344,440, Feb. 1, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 590,550

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—74 R **14 Claims**

1. A zero insertion force multi-contact electrical connector for connecting a mother panel board and a daughter panel board comprising an insulated housing having an upper major surface, a lower major surface for mounting on the surface of a mother board, opposed sidewalls and opposed endwalls, a trough-like recess extending into said upper major surface between said endwalls and parallel to said sidewalls for receiving edge portions of a daughter board, a plurality of side-by-side cavities divided therebetween by barrier walls on at least one side of said recess extending from said recess towards an associated sidewall, each cavity to receive a contact terminal inserted therein, contact terminals insertable into said cavities and securable to said housing proximate said lower major surface, said terminals for electrically engaging respective conductors on said mother and daughter boards, openings in said barrier walls on said at least one side of said recess for receiving a camming rod insertably therethrough extending from one endwall to the other parallel to said recess proximate said upper major surface, holding means on each endwall for holding a camming rod inserted therein, a camming rod insertable through said openings in said barrier walls on said at least one side of said recess and securable in said holding means, said camming rod being rotatable to cammingly engage said terminals away from said recess for placing a daughter board therein under zero insertion force conditions, characterized in that:

each cavity extends from said upper major surface towards said lower major surface and from said recess laterally toward an associated sidewall and having an enlarged upper portion and a lower portion reduced in cross section, said upper portion having an outwardly facing shoulder proximate an associated sidewall;



each terminal has a spring arm portion, a first contact portion adjacent an upper end of said spring arm portion for engaging a respective conductor on said daughter board, a bight section extending laterally from said upper end of said spring arm portion towards an associated sidewall, a tip section depending substantially vertically from said bight section which tip section is cammingly engageable by an associated said camming rod, said tip section having a lower end bearing against said outwardly facing shoulder of said cavity upon insertion of said terminal into a respective said cavity such that said upper end of said spring arm is normally extending into said recess, said terminal being tightly gripped in said lower portion of said cavity, and said terminal having a lower end extending past said lower major surface of said housing upon insertion and securable to said housing, said lower end having a second contact portion on said lower end for engaging a respective conductor on said mother board;

said camming rod has a longitudinal chordal surface portion and a cylindrical surface portion;

said camming rod is insertable in said housing after said terminals have been inserted into said cavities being partially surrounded by said tip sections and said bight sections of said contact terminals;

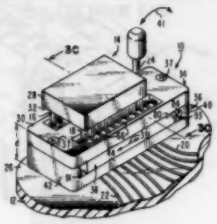
said openings of said barrier walls have surface portions which support portions of said arcuate surface of an associated said camming rod during rotation thereof.

4,478,472

ELECTRICAL CONNECTOR

Louis S. Baar, Clark, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 314,846, Oct. 26, 1981, abandoned.
This application Dec. 14, 1983, Ser. No. 561,272
Int. Cl.³ H01R 13/639
U.S. Cl. 339—75 M 4 Claims



1. An electrical connector comprising:

an electrically insulating housing including first and second facing contiguous releasable members, said members having a component receiving cavity in at least one of said members at the interface of said members and enveloped by both said members;

an array of spaced electrically conductive terminals each having a first end and a second end opposite the first end, one end being adapted to be connected to a first electrical connector at an outer face of one of said members, the other terminal end being adapted to be connected to a second electrical conductor at an outer face of the other of said members on a side of the housing opposite said one member outer face, each said terminals having a portion adjacent said cavity and adapted to be selectively connected to a lead of a component within said cavity, the terminals of said array being spaced in a given direction, said terminal ends extending in a direction generally normal to said given direction;

said terminals including a pair of spaced elements at least one of which is movable in said given direction, said housing including a third electrically insulating member fixed to one of the first and second members, the other of said first and second members being movably secured between the third and the one member for movement in a direction parallel to said given direction, said terminal one movable element being engaged with said other of said first and second members and movable in said parallel direction, and actuating means secured to said housing for selectively moving said other of said first and second members and said movable element in a direction at least toward said other element of said pair; and

a bus conductor in said cavity extending in said given direction electrically isolated from said terminals and adapted to be selectively attached to at least one lead of any one of a plurality of components and any one of said terminals in said cavity, said bus conductor being secured in said cavity by its attachment to said one component and said one terminal.

4,478,473

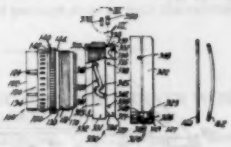
COUPLING NUT FOR AN ELECTRICAL CONNECTOR

David L. Frear, Afton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 431,969
Int. Cl.³ H01R 13/623
U.S. Cl. 339—89 M 9 Claims

1. A coupling nut for an electrical connector of the type having first and second shells (100, 200) connectable in end-to-end relation, one of said shells (100) including a plurality of ratchet teeth (150) arranged annularly and extending radially outward therefrom, the coupling nut including a cylindrical sleeve (330) captivated for rotation about said first shell (100) and provided with internal thread (310) for threadably connecting with complementary external thread (210) disposed on said second shell (200), rotation of the coupling nut drawing the shells (100, 200) together, said coupling nut characterized by:

said cylindrical sleeve (330) being provided with an opening (338), said opening being in register with and about said ratchet teeth (150);



a lock pin (350) having its cross-section clearance fit within said opening and constrained for only radial movement in said opening (338);

bias means (370) having a portion thereof disposed against said sleeve for constantly biasing said lock pin radially outward from engagement with said ratchet teeth; and

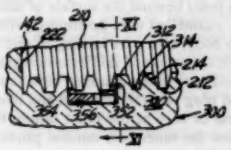
drive means (320, 329) disposed for both rotational and axial movement relative to the cylindrical sleeve for driving the cylindrical sleeve in coupling and uncoupling directions and driving the lock pin radially inward and into engagement with the ratchet teeth.

4,478,474

COUPLING NUT FOR AN ELECTRICAL CONNECTOR

David O. Gallusser, Oneonta, and Ann E. Peterson, Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 431,970
Int. Cl.³ H01R 13/62
U.S. Cl. 339—89 M 10 Claims



1. A coupling nut for an electrical connector comprising: a pair of mating shells, the coupling nut being captivated for rotation about one of the shells and provided with first thread (310) for threadably coupling with complementary second thread (210) disposed on the other of said shells, said coupling nut characterized by: an annular groove (350) disposed medially within said first thread (310); and an anti-decoupling device (400) for resisting uncoupling of said electrical connector shells, including an annular spring band (410) in said annular groove and a resilient spring member (440) extending radially inward from the annular groove for biasing radially against the second thread (210), said spring member comprising an arched leaf spring extending from the spring band as a cantilever and including a free end (442) to engage the annular groove (350) and a medial portion (446) to radially engage the surface of the second thread (210).

4,478,475

METHOD AND PLUG FOR SECURING A CONNECTING WIRE TO A TUBULAR PIN

Flemming Tullin, Ballerup, Denmark, assignor to Ortofon Manufacturing A/S, Valby, Denmark

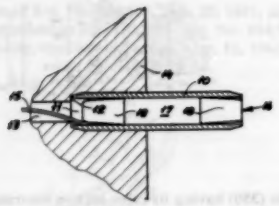
PCT No. PCT/DK80/00044, § 371 Date Mar. 2, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00328, PCT Pub. Date Feb. 5, 1981

Continuation of Ser. No. 243,918, Mar. 2, 1981, abandoned. This PCT application Jul. 16, 1980, Ser. No. 534,941

Claims priority, application Denmark, Jul. 17, 1979, 2992/79

Int. Cl.³ H01R *4/50*

U.S. Cl. 339—97 R **2 Claims**



2. A pick-up unit having an outwardly extending plug pin for establishing electrical connection with a wire within said unit, said electrical connection comprising:

(a) a pick-up body having a hole extending into said body and having a first diameter, said hole including an enlarged portion adjacent the surface of said body, said enlarged portion extending partially into said body to a termination point and having a second diameter concentric with said first diameter, and an inwardly directed shoulder at said termination point;

(b) a tubular plug pin positioned within the enlarged portion of said hole and having an end extending outwardly of said hole, the other end of said plug abutting said shoulder;

(c) an insertion plug having a cylindrical central portion and conical portions at each end thereof having substantially the same configuration, said central portion having a diameter substantially equal to the inner diameter of said plug pin, said insertion plug positioned within said plug pin with the central portion of said insertion plug extending to a point beyond the surface of said pick-up body; and

(d) a thin, enamelled wire positioned within said hole in said pick-up body, said wire having an end extending from the cylindrical portion of said insertion plug inwardly of said hole, said wire being clamped between said insertion plug and said plug pin, the clamped end being flattened from a thickness of zero at the point where the cylindrical portion joins the innermost conical portion of said insertion plug to full diameter at the innermost conical end, the enamel on said clamped end being in burst condition to provide good electrical contact between said wire and said plug pin, said conical end portions of said insertion plug having a diameter at the outermost ends thereof that is no greater than the difference between the inner diameter of said tubular plug pin and two diameters of said wire whereby either end of said plug can be inserted into said plug pin to effect the connection of said wire thereto.

4,478,476

DIP BURN-IN SOCKET

Elmer R. Jones, 124 Chestnut St., North Reading, Mass. 01854

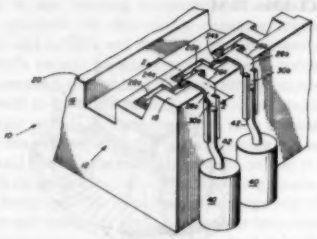
Filed Apr. 19, 1982, Ser. No. 369,479

Int. Cl.³ H01R *3/00*

U.S. Cl. 339—147 R **4 Claims**

1. In a burn-in tray having a plurality of dip burn-in sockets arrayed thereon, the sockets having ribbon-like contacts in side-by-side relationship received therein and extending externally of the socket body, resistors secured to the contacts external of said sockets, the improvement which comprises:

The contacts having a first larger width within the socket body, the contacts extending externally of the socket body formed into a necked portion of a second width narrower



than the first width, the contact terminating in a depending end of a third width narrower than the first width which end is adapted to receive the lead of a resistor; and wherein the socket body includes outer walls each having upper edges, the necked portion extends across the upper edge and then downwardly.

4,478,477

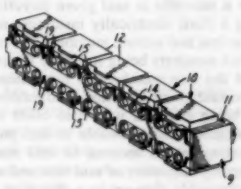
ELECTRICAL WIRE CONNECTOR HOLDER

Larry D. Fleisher, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1982, Ser. No. 388,888

Int. Cl.³ H01R *9/00*

U.S. Cl. 339—198 G **3 Claims**

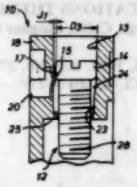


1. A unitary molded plastic holder for a multiplicity of electrical wire connectors of the type wherein a plastic body and cover are latched in an open position, wires to be connected are inserted between them and they are pressed together to a crimped position to connect the wires in an insulation displacement contact element within the connector, comprising an elongate body having a multiplicity of electrical wire connector receptacles in two rows, one row of connector receptacles being on each of two opposing longitudinal surfaces of said elongate body with each connector receptacle in one row being in back-to-back relation to a connector receptacle in the other row, each said receptacle being formed to receive and support a said electrical wire connector in its latched open position for receipt of wires to be connected, and resilient connector latching means for each of said receptacles into which a said electrical wire connector can be snapped for releasably retaining a said electrical wire connector in its latched open position and in its crimped position in a manner permitting a said electrical connector to be removed therefrom by pulling on the connector.

4,478,478
ELECTRICAL APPARATUS WITH RETAINING MEANS FOR A TERMINAL SCREW

Guy Durand, Montville, and Gérard Roby, Bihorel, both of France, assignors to Legrand S.A., Limoges, France

Continuation of Ser. No. 428,774, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 168,739, Jul. 14, 1980, abandoned. This application Oct. 24, 1983, Ser. No. 544,646
Claims priority, application France, Aug. 3, 1979, 79 19959
Int. Cl.³ H01R *9/10*
U.S. Cl. 339—263 R **25 Claims**

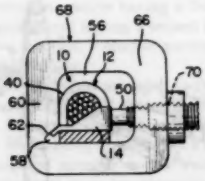


1. An electrical connector assembly comprising a body of insulating material, a sleeve integral with said body and having an axially outer end portion for receiving a screw of a connecting terminal and an axially inner end portion beyond which is mounted the connecting terminal, the screw being adapted to be introduced through the axially outer end portion and displaced to the axially inner end portion for threaded engagement with the connecting terminal, retaining means for retaining the head of the screw at said axially inner end portion of said sleeve, said retaining means comprising a protuberance projecting transversely inwardly of said sleeve, said protuberance being formed on a resiliently deflectable thin wall zone of said sleeve intermediate the axial ends thereby, said resiliently deflectable thin wall zone permitting the screw head to clear said protuberance into said axially inner end portion and thereafter retaining said screw head in said axially inner end portion of said sleeve.

4,478,479
ELECTRICAL TERMINAL

Hitesh Cherry, Harrisburg, and Walter M. Werner, Downington, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 13, 1982, Ser. No. 407,671
Int. Cl.³ H01R *4/50*
U.S. Cl. 339—273 R **1 Claim**



1. In combination, an electrical terminal and device for terminating a wire therein, comprising:

a. a first member including an elongated body of conductive material and having a first passage extending axially therethrough and a second passage extending transversely therethrough and intersecting the first passage;

b. a second member adapted to be driven into the second passage and having thereon a wire engaging surface so that a wire which may be in the first passage may be compressed for electrical contact and for retention against axial pullout therefrom and further having a leading end which extends out from the body and which is susceptible to being bent such that it cannot be withdrawn from the second passage;

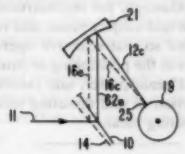
c. a frame-like structure having an opening therethrough to receive the first member, a notch with one beveled side located in the inside surface of one wall defining the opening, and a second opening in another wall opposing the one wall; and

d. driving means positionable in the second opening for driving the second member into the second passage in the body and for driving the leading end of the second member into the notch whereby the leading end is bent out of line of the second passage so as to lock the second member therein.

4,478,480
HOLOGRAPHIC SCANNER SPINNER WOBBLE CORRECTION SYSTEM

David E. Doggett, Cupertino, Calif., assignor to Benson, Inc., Mountain View, Calif.

Filed Dec. 27, 1982, Ser. No. 453,362
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—3.71 **5 Claims**



1. In an optical scanning system including a source of a monochromatic collimated light beam and a transmission-type hologram spinner having formed thereon a series of plane holographic linear diffraction grating facets, said spinner being placed to diffract said light beam, said spinner being subject to a degree of translational wobble, the improvement comprising

means for focusing said light beam in one direction;

means mounting said spinner on its axis of rotation such that the angle made by the diffracted light beam with the incident light beam is 90°, and the angle of diffraction is approximately equal to the angle of incidence, said diffracted beam being displaced to a path parallel to the path it would occupy in the absence of translational wobble;

corrective means for directing and focusing said diffracted light beam in a direction perpendicular to said one direction; to a position on a moving scan surface which it would occupy in the absence of translational wobble.

4,478,481
PRODUCTION OF DIFFRACTION LIMITED HOLOGRAPHIC IMAGES

Richard L. Fusek, Dayton; James S. Harris, Centerville, and Kevin G. Harding, Dayton, all of Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Feb. 12, 1982, Ser. No. 348,461
Int. Cl.³ G03H *1/02, 1/22*
U.S. Cl. 350—3.83 **9 Claims**

1. Apparatus for the production of a holographic image of a subject disposed at a subject plane, comprising:

a source for generating a substantially coherent beam of light;

a beamsplitter for dividing said beam into a subject beam and a reference beam;

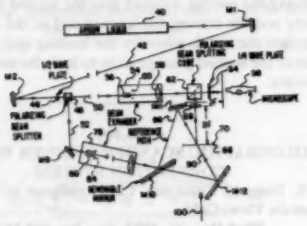
means for recording a hologram of said subject thereon;

a lens for passing therethrough light from said subject beam

reflected by said subject, and focussing said light onto or near one side of said recording means;

means for directing said reference beam to said one side of said recording means at a predetermined angle of incidence thereon; and

means for selectively redirecting said reference beam, following recording of said hologram on said recording means, to the opposite side of said recording means in a



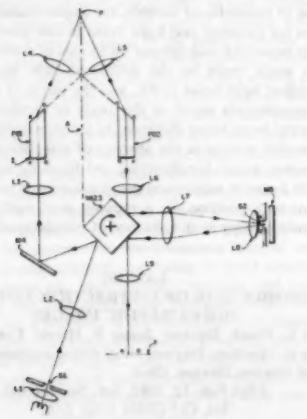
conjugate direction for diffraction thereby into said lens in a direction exactly opposite to that travelled by said subject beam therethrough, for reconstruction of said holographic image at said subject plane, said redirecting means being constructed so that selective operation thereof requires no change in the positioning or orientation of any of said source, said beamsplitter, said recording means, said lens, or any portion of said directing means not common with said redirecting means.

4,478,482

AXIAL SCANNING OPTICAL SYSTEM AND METHOD OF EXAMINING AN OBJECT PLANE

Charles J. Koester, 60 Kent Rd., Glen Rock, N.J. 07452

Filed May 11, 1981, Ser. No. 262,329
Int. Cl.³ G02B *21/00, 21/16, 21/17*
U.S. Cl. 350—6.6 **55 Claims**



1. A method of viewing an object plane with an optical instrument adapted to illuminate said object plane with illumination light along an illumination axis and for forming an image of said object plane along an image onto a final image plane, said optical instrument having an instrument axis, said instrument axis being the bisector of the angle between said illumination and image axis, said object plane being positioned such that said instrument axis is at an angle which is non-normal relative to said object plane, said method comprising the steps of:

(a) scanning said illumination light across said object plane;

(b) imaging said object plane onto said final image plane to form a focused image; and

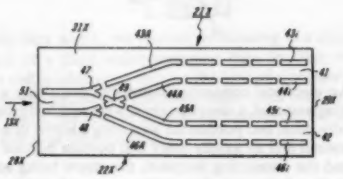
(c) rectifying said final image plane with image rectifying means adapted to satisfy the Scheimpflug conditions.

4,478,483

VARIABLE LENGTH ELECTRO-OPTIC WAVEGUIDES AND APPLICATIONS THEREFOR

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 10, 1982, Ser. No. 376,910
Int. Cl.³ G02B *5/174*
U.S. Cl. 350—96.14 **12 Claims**



1. A variable length waveguide for guiding light in a generally longitudinal direction, said waveguide comprising

an electro-optic element; and

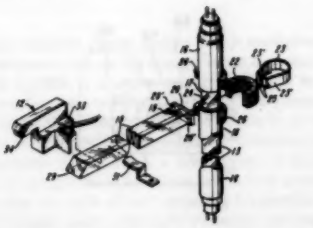
a pair of laterally spaced electrodes proximate a longitudinal surface of said electro-optic element; at least one of said electrodes being defined by a plurality of individually addressable electrode segments which are layered in longitudinally interleaved and overlapping relationship with one another.

4,478,484

RESILIENT OPTICAL CONNECTOR BETWEEN A LIGHT CONDUCTOR AND AN IONIZATION BULB

John W. Pratt, Jr., Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 9, 1981, Ser. No. 328,891
Int. Cl.³ G02B *5/14, 7/26*
U.S. Cl. 350—96.20 **7 Claims**



1. An optical system including a light bulb, a light conductor for conducting light from the bulb to a remote location, means for holding the light conductor against the bulb, and wherein the holding means includes a resilient pad extending partially about the bulb and a member in gripping relation with the light conductor and urging the resilient pad to hold the conductor and the bulb in light transmitting relationship.

4,478,485

CONNECTOR FOR COUPLING AT LEAST ONE OPTICAL FIBER TO A FURTHER OPTICAL ELEMENT

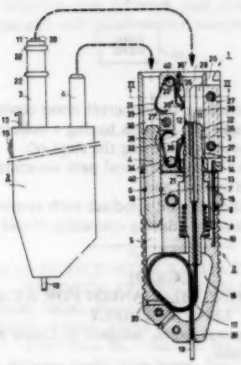
Giok D. Khoe; Johannes H. F. M. Van Leest, and Lambertus J. Meuleman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 375,150

Claims priority, application Netherlands, May 12, 1981, 8102309

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 9 Claims



1. A connector for coupling at least one optical fiber to a light source, a light detector, or another optical fiber, said connector comprising:

a holder having a longitudinal direction;

a pin extending from the holder in the longitudinal direction and secured to the holder;

a cylindrical member extending from the holder in the longitudinal direction and being arranged in the holder to be resiliently displaceable in the longitudinal direction, said cylindrical member having a diameter;

a central connection portion having a first bore adjacent a V-shaped groove and having a second bore, said first and second bores and said V-shaped groove extending in the longitudinal direction;

resilient hold-down means arranged in the central connection portion opposite the V-shaped groove for holding the cylindrical member in the V-shaped groove, said resilient hold-down means being arranged such that in the absence of the cylindrical member in the V-shaped groove the maximum diameter of an imaginary circle which can be inscribed between the V-shaped groove and the resilient hold-down means in a plane perpendicular to the longitudinal direction is less than the diameter of the cylindrical member at the location where the cylindrical member is held by the resilient hold-down means; and

resilient clamping means arranged in the central connection portion opposite the V-shaped groove for clamping the cylindrical member in the V-shaped groove, said resilient clamping means being actuatable by the pin secured to the holder when the pin is slid into the second bore in the central connection portion.

4,478,486

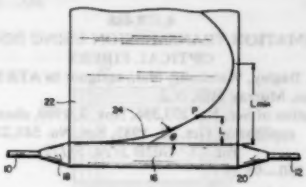
FIBER OPTIC SPLICE ORGANIZER

Vernon A. Fentress, Castro Valley, and Francois Comet, Belmont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 12, 1982, Ser. No. 407,670

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.20 37 Claims



1. A method of organizing a bight between two points in an optical fiber, comprising the steps of:

(a) laying said bight on a sheet in such a fashion that, when said sheet is wrapped about itself in a spiral fashion about a longitudinal axis, a radius of any bend in the fiber is greater than the minimum bending radius of said fiber and at least one cross-section taken through the wrapped sheet along a plane essentially perpendicular to said axis will intersect the fiber at at least two points; and

(b) wrapping said sheet about itself in a spiral fashion in such a manner that an innermost turn of said wrapped sheet has a radius smaller than said minimum bending radius of said optical fiber.

4,478,487

OPTICAL FIBER CONNECTORS

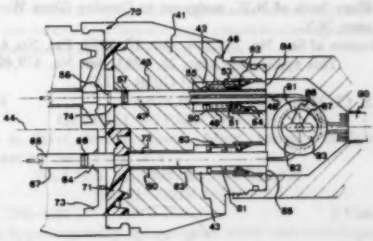
Albert Obeissart, Estrees S/Denis, France, assignor to Souriau & Cie (SA), Boulogne, France

Filed May 18, 1982, Ser. No. 379,328

Claims priority, application France, May 19, 1981, 81 09900; Jun. 26, 1981, 81 12574; Jul. 23, 1981, 81 14321; Oct. 23, 1981, 81 19900

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 43 Claims



1. Connector for two optical fibers comprising at least one body composed of a one-piece member in which is provided an axial bore, and a ferrule supporting an optical fiber in said bore, wherein said one-piece member has its axial bore defined by two coaxial cylindrical surfaces of revolution having different diameters, two (first and second) ferrules supporting in an internal bore the said two fibers respectively, these two ferrules each being delimited respectively by an external cylindrical surface of revolution complementary to that of the one-piece member having the smaller diameter, at least one first sleeve mounted around a first of said ferrules with a certain clearance, first elastic linking means between said sleeve and said first ferrule, said sleeve being delimited externally by a

cylindrical surface of revolution complementary to that of said body member having the larger diameter, these two ferrules being introduced into said body member such that, firstly, they are positioned at least partially in said axial bore of smaller diameter and, secondly, such that the sleeve is placed in said axial bore of larger diameter.

4,478,488

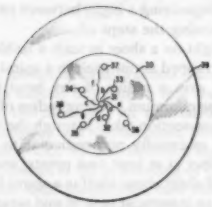
INFORMATION TRANSMISSION USING DISPERSIVE OPTICAL FIBERS

Brian G. Bagley, Watchung, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 203,356, Nov. 3, 1980, abandoned. This application Oct. 21, 1983, Ser. No. 543,231

Int. Cl.³ G02B *5/14, 5/172*

U.S. Cl. 350—96.23 **13 Claims**



1. An optical fiber cable comprising a central clad fiber situated at the center of the cable, and a plurality of clad fibers arranged around the periphery of the central fiber with the plurality of clad fibers having different fiber diameters and twisted about the center of the cable so that the length of the fibers differs over a given cable length.

4,478,489

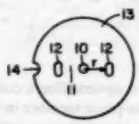
POLARIZATION RETAINING SINGLE-MODE OPTICAL WAVEGUIDE

Michael G. Blankenship, Corning, and Donald B. Keck, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 253,224, Apr. 13, 1981, Pat. No. 4,395,270. This application Mar. 28, 1983, Ser. No. 479,490

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.30 **10 Claims**



1. A single-mode optical waveguide fiber comprising a core of transparent glass and a layer of cladding glass on the surface of said core, the refractive index of said core being greater than that of said cladding glass, a first pair of diametrically opposed longitudinally-extending glass regions located in said cladding, said regions being spaced from said core, the thermal coefficient of expansion of said glass regions being different than that of said cladding glass.

4,478,490

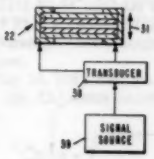
NOISE REDUCTION IN COHERENT SYSTEMS

John E. Wreede, Monrovia, and James A. Arns, Culver City, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 317,208, Nov. 2, 1981, abandoned. This application Oct. 25, 1983, Ser. No. 545,034

Int. Cl.³ G03H *1/32*

U.S. Cl. 350—162.11 **5 Claims**



1. A method of reducing the coherent noise content introduced in coherent radiation systems having a coherent radiation source, said method comprising the steps of:

disposing an apodizer along an optical path associated with a coherent radiation system; and

modulating the position of said apodizer with respect to said coherent radiation source during operation of said system.

4,478,491

FOCUS PRESETTING MECHANISM FOR A CAMERA LENS ASSEMBLY

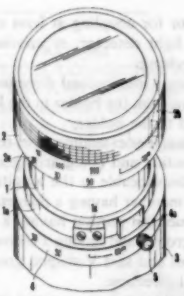
Tohru Kawai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 274,309, Jun. 16, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 583,788

Claims priority, application Japan, Jun. 18, 1980, 55-85350

Int. Cl.³ G02B *7/02*

U.S. Cl. 350—255 **2 Claims**



1. A focus presetting mechanism for a camera lens assembly including a focusing lens member comprising:

(a) a stationary barrel having a fixed index mark on the outer periphery thereof for distance adjustment, said stationary barrel having a first rotation stopping portion provided thereon;

(b) a focusing ring for shifting said focusing lens member along the optical axis of said lens assembly, said focusing ring having a second rotation stopping portion engageable with said first rotation stopping portion of the stationary barrel and having a distance scale on the outer periphery thereof;

(c) focus presetting means having a focus presetting ring and a tightening member, said focus presetting ring being inserted rotatably about the optical axis between said

stationary barrel and said focusing ring and being provided on its outer periphery a distance scale of the same magnitude as that of said distance scale of said focusing ring in side-by-side relation with said distance scale; and

(d) a third rotation stopping portion on said focus presetting ring engageable with said second rotation stopping portion, said tightening member being settable in loosened and tightened conditions and operating such that when in said loosened condition it sets said focus presetting ring in a freely rotatable manner so as to enable performance of a focus adjustment without restriction by said third rotation stopping portion of said focus presetting ring, and when in said tightened condition it fixed said third rotation stopping portion of said focus presetting ring at any desired distance position so as to set a distance adjusting zone of said focusing ring between said first rotation stopping portion and said third rotation stopping portion.

4,478,492

OPTICAL DEVICE WITH BAYONET MOUNT AND POSITION RESTRICTION MEANS

Makoto Ando, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 18, 1982, Ser. No. 442,926

Claims priority, application Japan, Nov. 18, 1981, 56-183864; Nov. 18, 1981, 56-183865

Int. Cl.³ G02B 7/02

U.S. Cl. 350—257 **14 Claims**

1. An optical device adapted to be coupled to a complementary optical device by a bayonet mount coupling, said optical device comprising:

a first position restriction member capable of operating radially inwardly from an inoperative position to an operative position for restricting the angular position of said complementary optical device relative to said optical device;

a first biasing means for biasing said first position restriction member to its operative position;

a second position restriction member capable of operating in the direction of the optical axis of said optical device from an inoperative position to an operative position for restricting the angular position of said complementary optical device relative to said optical device;

a second biasing means for biasing said second position restriction member to its operative position; and

a position restriction release means arranged to be operated by an external operation to retract said first and second position restriction members to their respective inoperative position for the release of the position restriction achieved.

4,478,493

APPARATUS HAVING LIQUID CRYSTAL FINDER OPTICAL SYSTEM

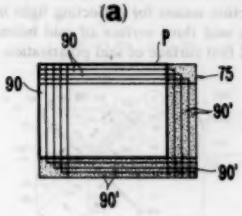
Hideo Yokota, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,208

Claims priority, application Japan, Apr. 20, 1981, 56-60459; Jun. 10, 1981, 56-88051

Int. Cl.³ G02F 1/13; G03B 13/20, 13/14, 13/10

U.S. Cl. 350—336 **6 Claims**



4. A photographic apparatus, comprising:

(a) a photographic optical system;

(b) a finder optical system independent of said photographic optical system;

(c) display means for displaying at least one of a photographic viewfield frame and a range finding spot through said finder optical system;

said display means having a plurality of liquid crystal pieces for changing the display of said display means; and

(d) signal means for generating signals for selectively changing the state of said liquid crystal pieces in correspondence to a focal length of said photographic optical system.

6. A photographic apparatus, comprising:

(a) a photographic optical system;

(b) a finder optical system independent of said photographic optical system;

(c) display means for displaying at least one of a photographic viewfield frame and a range finding spot through said finder optical system,

said display means having a plurality of liquid crystal pieces for changing the display of said display means; and

(d) means for automatically focusing said photographic optical system; and

(e) signal means for generating signals for selectively changing the state of said liquid crystal pieces in correspondence to operations of said focusing means.

4,478,494

OPTICAL BYPASS SWITCH

Richard A. Soref, Newton Centre, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 322,820

Int. Cl.³ G02F 1/133

U.S. Cl. 350—381 **8 Claims**

1. An apparatus with first, second, third and fourth ports positioned in substantial alignment with a first plane and having a first state wherein arbitrarily polarized light resolvable into first and second linear polarization components incident to the first port is coupled to the second port and such light incident to the third port is coupled to the fourth port and a second state wherein the arbitrarily polarized light incident to the first port is coupled to the fourth port and such light incident to the third port is coupled to the second port comprising:

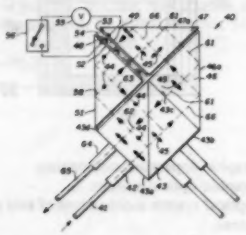
beam splitter means having a first surface in light exchanging relationship with said first and fourth ports and a second surface in light exchanging relationship with said second and third ports for coupling light components at said first linear polarization between said first surface and a third surface thereof and light components at said second linear

polarization between said first surface and a fourth surface thereof;

means for applying a first voltage and a second voltage corresponding respectively to said first and second states;

polarization twist means having first and second surfaces coupled to said voltage applying means for rotating light polarization through a first angle when said first voltage is applied across said first and second surfaces and through a second angle when said second voltage is applied across said first and second surfaces; and

first deflection means for deflecting light in said first plane between said third surface of said beam splitting means and said first surface of said polarization twist means and



between said second surface of said polarization twist means and said fourth surface of said beam splitting means whereby signals incident to said first port are coupled through said apparatus to said second port and signals incident to said third port are coupled through said apparatus to said fourth port when said first voltage is applied across said first and second surfaces of said polarization twist means and signals incident to said first port are coupled through said apparatus to said fourth port and signals incident to said third port are coupled to said second port when said second voltage is applied across said first and second surfaces to said polarization twist means.

4,478,495

LIGHT GATE ASSEMBLIES, ELEMENTS AND MANUFACTURING METHODS

Norbert E. Samek, Sierra Madre, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed Apr. 30, 1979, Ser. No. 34,894

Int. Cl.³ G02F *1/03*; H05K *7/00*

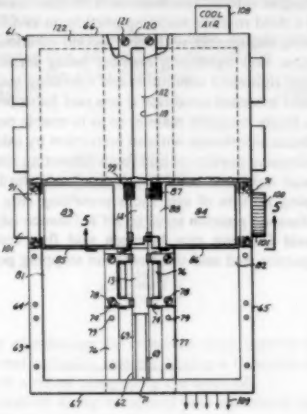
U.S. Cl. 350—392 **45 Claims**

1. In a method of providing an elongate light gate structure of a plurality of individual chips including electrooptically active light gate material displaying field induced birefringence, the improvement comprising in combination the steps of:

providing said chips in rectangular configuration;

providing on each chip a plurality of alternating electrodes and elongate light gate regions extending parallel to opposite sides of the rectangular chip;

providing a rigid beam with a pair of spaced parallel elongate mounting surfaces and an elongate opening located between and extending along said mounting surfaces; and



mounting said chips side by side on said pair of mounting surfaces, with said light gate regions registering with said opening.

4,478,496

ZOOM LENS

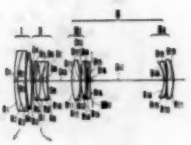
Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,185

Claims priority, application Japan, Apr. 17, 1981, 56-58805

Int. Cl.³ G02B *15/14*

U.S. Cl. 350—427 **2 Claims**



1. A zoom lens comprising:

a first lens component having a positive refractive power and being movable when zooming;

a second lens component having a negative refractive power and being movable when zooming, said second lens component lying on the image side of said first lens component;

a third lens component having a positive refractive power and being stationary when zooming, said third lens component lying on the image side of said second lens component;

whereby letting f_I denote the focal length of said first lens component, f_{II} the focal length of said second lens component, e_{12} the interval between the principal points of said first and second lens components in the shortest focal length position, and ξ and η said first and second lens components moving from their wide angle positions as the starting point respectively when zooming is performed in the direction from the object side to the image side taken as positive, the ratio of the speed of said second lens com-

ponent to the speed of said first lens component, or $d\eta/d\xi$ expressed by

$$d\eta/d\xi=(\eta+Q)/(2\eta-\xi+P)$$

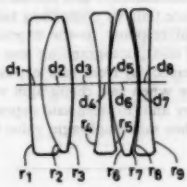
$$P=(e_{12}'-f_I-f_{II})+Q$$

$$A=-(f_{II})^2/(e_{12}'-f_I-f_{II}),$$

satisifies the following condition in the telephoto positions of said first and second lens components:

$$0.4<-d\eta/d\xi<5.$$

4,478,497
ATTACHMENT LENS SYSTEM
Shinichi Mihara, Hachiooji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Nov. 12, 1982, Ser. No. 440,859
Claims priority, application Japan, Nov. 19, 1981, 56-184439
Int. Cl.³ G02B 9/64, 15/02
U.S. Cl. 350—476 8 Claims

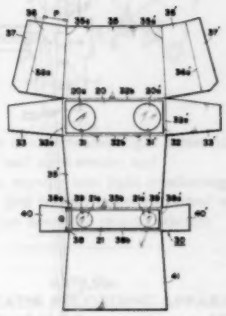


1. An attachment lens system comprising a front lens group and a rear lens group wherein said front lens group comprises first and second lens components and said rear lens group comprises a third lens component in the order from the object side, said first lens component being a cemented doublet consisting of a negative meniscus lens arranged to be convex toward the object side and a biconvex lens and having positive refractive power, said second lens component comprising a biconcave lens, said third lens component comprising two lens elements wherein one is a biconvex lens and the other is a biconcave lens, said attachment lens system being arranged to fulfill the conditions (1) through (4) shown below:

(1) $-0.1<e/|f|<0.1$
(2) $0.15<\Sigma d/|f|<0.4$
(3) $d_5/\Sigma d<0.27$
(4) $r_6<-r_7$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol e represents the distance between the principal point of the front lens group and the principal point of the rear lens group, reference symbol Σd represents the distance from the first lens surface to the final lens surface, reference symbol d_5 represents the airspace between the second lens component and third lens component, and reference symbols r_6 and r_7 respectively represent radii of curvature of the surface on the object side and surface on the image side of the third lens component (radii of curvature of the surface on the object side and cemented surface when the third lens component is arranged as a cemented doublet).

4,478,498
FOLDABLE BINOCULAR ASSEMBLY
Kaisaku Ohno, No. 7-4, Minamihonmachi 2-chome, Urawa-shi, Saitama-ken, Japan
Filed Mar. 7, 1983, Ser. No. 472,823
Claims priority, application Japan, Mar. 8, 1982, 57-32238
Int. Cl.³ G02B 23/18, 7/02
U.S. Cl. 350—546 4 Claims



1. A binocular assembly of comparatively thin material in foldable formation, comprising:

(a) a first rectangular member constituted of a pair of openings disposed therein in spaced-apart relation to each other, a lens plate attached onto an internal surface of said first rectangular member and defining two object lenses with said paired openings, and two trapezoidal flaps of substantially identical configuration extending oppositely from both sides of said first rectangular member via two lengthwise lines of fold thereof;

(b) a first trapezoidal member connected upwardly to said first rectangular member along one widthwise line of fold thereof, and including two trapezoidal flaps of substantially identical configuration extending oppositely from both sides thereof via two lengthwise lines of fold thereof, said flaps each having an elongate overlap portion of substantially identical configuration connected thereto along a lengthwise line of fold thereof;

(c) a second trapezoidal member being substantially identical in configuration and opposite to said first trapezoidal member and connected to said first rectangular member along the other widthwise line of fold thereof;

(d) a second rectangular member connected along one widthwise line of fold thereof to said second trapezoidal member, and including a pair of openings disposed therein in spaced-apart relation to each other and in alignment with said first paired openings of said first rectangular member, a lens plate attached onto an internal surface of said second rectangular member and defining two eyepieces with said second paired openings, and two trapezoidal flaps of substantially identical configuration extending oppositely from both sides of said second rectangular member via two lengthwise lines of fold thereof; and

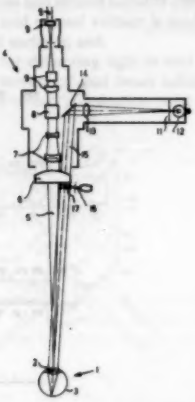
(e) a third trapezoidal member being substantially identical in configuration to said first and second trapezoidal members and connected downwardly to said second rectangular member along the other widthwise line of fold thereof, whereby said binocular when assembled is in the form of a hexahedral frustum of a pyramid.

4,478,499

OPERATION MICROSCOPE WITH FIXATION DEVICE

Peter G. Hoerenz, Hartsdale, N.Y., assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,207
Int. Cl.³ A61B 3/10
U.S. Cl. 351—211 14 Claims



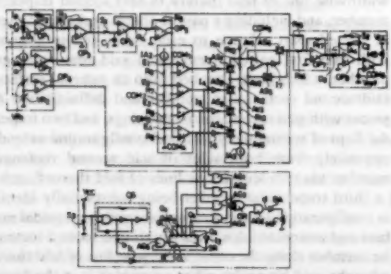
1. In a binocular stereo operation microscope wherein a single main objective serves each of two spaced optical systems and has the capability of focusing said optical systems at the exterior surface of the eye of a patient under observation, the improvement in which a fixation-mark and light-projection system therefor also utilizes said main objective in its optical path of fixation-mark projection, whereby the main objective is part of the light-projection system, said light-projection system projecting collimated light upon the patient's eye so that the patient's eye can see the mark at infinity through the same objective as is being used by an examining physician to observe exterior surface of the patient's eye.

4,478,500

EXPOSURE CONTROLLING DEVICE ADAPTED TO CAMERAS USING INTERCHANGEABLE LENSES

Yasuo Ishiguro, Tokyo, Japan, assignor to Copal Company Limited and Konishiroku Photo Industry Co., Ltd., both of Tokyo, Japan, a part interest

Continuation of Ser. No. 185,444, Sep. 9, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,744
Claims priority, application Japan, Sep. 14, 1979, 54-118142
Int. Cl.³ G03B 7/08
U.S. Cl. 354—443 3 Claims



1. An exposure controlling device for use with cameras using interchangeable lenses having respectively predetermined F-numbers comprising:

a first means for determining an exposure value for a field of view to be photographed by measuring the light from the field of view after that light has passed through a photographing lens having a fully opened diaphragm aperture,

a second means connected to said first means for establishing a plurality of predetermined exposure zones and determining to which one of these exposure zones said exposure value belongs, the second means including a plurality of comparing circuits each having a first input terminal connected to said first means and a second input terminal respectively connected to one of a plurality of reference voltage sources each providing a different voltage, only one of said comparing circuits containing within its range a voltage corresponding to an exposure value determined by said first means thereby determining an exposure zone,

a third means connected to said second means for determining a diaphragm value for said photographing lens in response to the exposure zone determined by said second means, the third means including a plurality of gate circuits each one having a first input terminal respectively connected to an output terminal of its respective comparing circuit and a second input terminal respectively connected to one of a plurality of pulse generating circuits providing a predetermined number of pulses per unit time, only said gate circuit connected to said operated comparing circuit being operated to pass a corresponding number of pulses to a diaphragm control element thereby to determine a diaphragm aperture corresponding to said discriminated exposure zone, and

a fourth means connected to said second means for determining an exposure time by comparing said diaphragm value determined in response to the exposure zone with the F-number of said photographing lens, the exposure time being determined (a) from said exposure value and diaphragm value when said diaphragm value is larger than said F-number and (b) from said exposure value and said F-number when said diaphragm value is smaller than said F-number.

4,478,501

SET OF DARK SLIDES FOR USE WITH A ZONE EXPOSURE SYSTEM

John H. Klancnik, 14900 W. Imperial Dr., Libertyville, Ill. 60048

Filed Apr. 4, 1983, Ser. No. 481,653
Int. Cl.³ G03B 17/00
U.S. Cl. 354—125 4 Claims

1. A set of dark slides for a film holder of a camera equipped with a lens in order to adapt the camera to be used with a zone system exposure procedure in which all of the exposures are made on a single piece of film,

each dark slide of the set of slides having a single zone exposure operating therein, the openings being of uniform size and shape and each having a relatively small area compared to the area of the piece of film so that a sufficient number of exposures can be made on a single piece of film to create a viable zone exposure procedure system,

each zone exposure opening being formed at a different location on each dark slide so that the zone exposure openings of all of the dark slides of the set of slides form a pattern of exposures on a piece of film when the piece of film is exposed separately with each dark slide in the holder,

the number of dark slides and the pattern of zone exposure openings in the dark slides being selected to provide a number of separate exposures on the piece of film in the slide holder equal to the number of zones in the zone exposure procedure being used and a pattern which permits comparison of one exposure with another while separating each exposure from adjacent exposures by substantial areas of unexposed film.

4,478,502

APERTURE CONTROL DEVICE FOR USE IN A STILL CAMERA

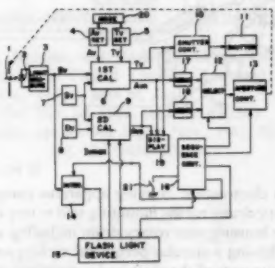
Masaaki Nakai, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 27, 1982, Ser. No. 424,496

Claims priority, application Japan, Sep. 29, 1981, 56-155936

Int. Cl.³ G03B 7/16

U.S. Cl. 354—416 **11 Claims**



1. An aperture control device for a still camera comprising:

an aperture stop device of a variable aperture size, and

means for controlling the aperture stop device including means for changing, during an exposure, the aperture size between a first size suitable for ambient light photography and a second size suitable for flash light photography in a predetermined timing relationship with the emission of the flash light, first means for producing a first signal to control said aperture stop device and second means for producing a second signal to control said aperture stop device, one of said first and second signals being indicative of said second size of aperture, said changing means also includes means for selecting between said first and second producing means to change the aperture size between said first and second sizes during an exposure.

4,478,503

WEIGHTED METERING DEVICE IN CAMERA

Sadahiko Tsuji, and Tokuichi Tsunekawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,563

Claims priority, application Japan, Feb. 19, 1981, 56-23597

Int. Cl.³ G03B 7/099

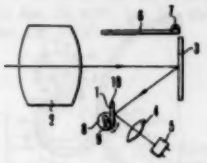
U.S. Cl. 354—480 **5 Claims**

1. A camera with a light metering device, comprising:

lens means for forming an object image on a film surface of the camera;

light measuring means for measuring the light passing through said lens;

light conducting means for directing a portion of the diffusedly reflected light from the film surface to said light metering means, said light conducting means being arranged to be movable between a first position where the diffusedly reflected light from the portion of the film surface farthest from said light measuring means is directed to said light measuring means and a second position where the diffusedly reflected light from the portion of



the film surface nearest to said light measuring means is directed to the said light means; and

driving means for moving said light conducting means between the first and second positions fastest as said light conducting means nears the second position.

4,478,504

ELECTROSTATIC RECORDING APPARATUS

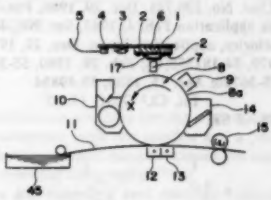
Atsuyuki Tanaka, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1982, Ser. No. 451,712

Claims priority, application Japan, Dec. 22, 1981, 56-208806; Dec. 25, 1981, 56-210355; Dec. 25, 1981, 56-210356; Apr. 26, 1982, 57-70818; Apr. 27, 1982, 57-71706

Int. Cl.³ G03G 15/00

U.S. Cl. 355—1 **16 Claims**



1. An electrostatic recording apparatus which comprises:

a fluorescence generation tube having a plurality of small-sized light emission segments aligned on a substrate;

an image-forming optical system for focusing light emitted from said light emission segments onto the surface of a photosensitive member and forming an electrostatic image on said surface of the photosensitive member; and

a plurality of driving circuits for controlling light emission of the light emission segments in response to image signals fed thereto.

4,478,505

DEVELOPING APPARATUS FOR IMPROVED CHARGING OF FLYING TONER

Tsuneo Tashiro, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 422,176

Claims priority, application Japan, Sep. 30, 1981, 56-155145; Dec. 26, 1981, 56-213017

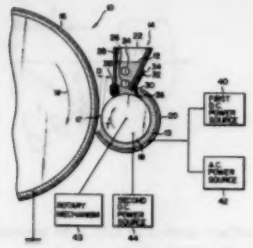
Int. Cl.³ G03G 15/08

U.S. Cl. 355—3 DD **15 Claims**

1. A developing apparatus for developing the surface of a photosensitive body by supplying developer particles thereto comprising:

developer supplying means for supplying developer particles;

a conveyor for conveying developer particles supplied from the developer supplying means to a gap between the surface of the photosensitive body and the conveyor via a



developer supplying passage defined between the conveyor and an electrode which faces the conveyor; and

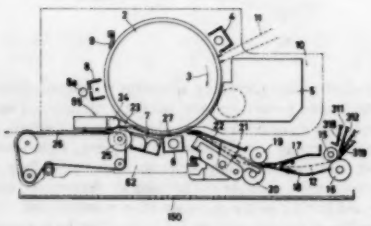
means for providing a first alternating electric field to the developer supplying passage whereby the developer particles strike against the conveyor and the electrode to be fully charged by friction.

4,478,506

ELECTROSTATIC COPYING APPARATUS HAVING IMPROVED COPY SHEET TRANSFER ARRANGEMENT

Yoshitake Miyoshi, Nara; Kiyoshi Shibata; Toshio Watanabe, both of Osaka; Masumi Kai, Nara, and Yousuke Ohata, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Division of Ser. No. 220,721, Dec. 29, 1980, Pat. No. 4,386,845.
This application Feb. 4, 1983, Ser. No. 464,065
Claims priority, application Japan, Dec. 29, 1979, 54-173526; Dec. 29, 1979, 54-181555[U]; Feb. 29, 1980, 55-26914[U]; Mar. 21, 1980, 55-36726; Apr. 15, 1980, 55-49854
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **4 Claims**



1. In an electrostatic copying apparatus of the type wherein a stationary original document image is projected onto a photosensitive member during movement of an optical device for exposing the original document, an electrostatic latent image of toner particles is developed on said photosensitive member and is transferred at a transfer zone onto a copy sheet which is moved through the apparatus along a copy sheet transport path by a copy sheet transport arrangement, and the image transferred to said copy sheet is fixed thereon, the improvement wherein said copy sheet transport arrangement comprises:

upper and lower guide plates for guiding the copy sheet to abut said photosensitive member at said transfer zone;

means for biasing said guide plates toward each other;

a frame mounted to pivot at a downstream portion thereof about a horizontal axis;

copy sheet transport means mounted on said frame for transferring from said transfer zone the copy sheet having thereon the copied image;

support means for maintaining an upstream portion of said frame adjacent said transfer zone; and

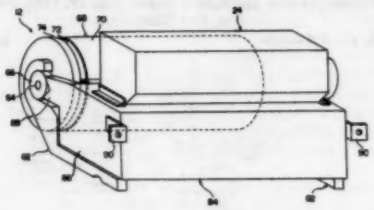
means for, upon downwardly pivoting said upstream portion of said frame about said axis, moving said lower guide plate away from said upper guide plate in the area of said transfer zone.

4,478,507

MOUNT FOR ROTARY DRUM IN AN ELECTROSTATIC COPYING APPARATUS

Hideo Miyoshi, Habikino; Tadashi Umeda, Yamato Takada, and Takashi Aoki, Kusatsu, all of Japan, assignors to Mita Industrial Company Limited, Japan

Division of Ser. No. 250,829, Apr. 3, 1981, Pat. No. 4,382,674.
This application Feb. 8, 1983, Ser. No. 465,063
Claims priority, application Japan, Apr. 15, 1980, 55-49497
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **3 Claims**



1. In an electrostatic copying apparatus comprising a housing; a rotary drum; means mounting said rotary drum rotatably within the housing; said rotary drum including a shaft, bearing members having a circular peripheral surface and mounted on two opposite ends of the shaft, and a drum member fixed to the shaft between the bearing members and having a photosensitive member on at least a part of the peripheral surface thereof; an original-support mechanism disposed on the top surface of the housing and including a transparent plate on which to place an original document to be copied; a charging corona-discharge device for applying corona discharge to the photosensitive member in a latent electrostatic image-forming zone located along the peripheral surface of the rotary drum; and optical unit for projecting the image of an original document placed on the transparent plate onto the photosensitive member in the latent electrostatic image-forming zone; a developing device for developing a latent electrostatic image formed on the photosensitive member by applying toner particles thereto in a developing zone located along the moving path of the photosensitive member and, viewed in the moving direction of the photosensitive member, both downstream of the latent electrostatic image-forming zone and upstream of the transfer zone, said developing device including a frame disposed adjacent the rotary drum and having two side plates spaced from each other a predetermined distance in the direction of the central axis of rotation of the rotary drum and a cylindrical rotary sleeve mounted rotatably between the side plates of the frame and extending substantially parallel to the rotary drum, said sleeve being adapted to hold a developer on its peripheral surface for application to the photosensitive member; and a copying paper transfer unit for transferring a copying paper through a predetermined transfer passage through a transfer zone located along the peripheral surface of the rotary drum and downstream of the developing zone in the rotating direction of the rotary drum; the improvement comprising a pair of guide and support members positioned within the housing and spaced from each other a predetermined distance in the direction of the central axis of rotation of the rotary drum, each of

the guide and support members having formed therein a shaft support opening with a recess extending substantially perpendicular to the central axis of rotation of the rotary drum and a main guide surface extending from the lower end of the recess in a direction away from the shaft support opening substantially perpendicularly to the central axis of rotation of the rotary drum such that when each of the peripheral surfaces of the bearing members of the rotary drum is moved along the respective main guide surface, each of the bearing members passes through the respective recess and is positioned within the respective shaft support opening; and a pair of projecting pieces, one projecting piece positioned at each of the two side plates of the frame of the developing device such that after positioning each of the bearing members of the rotary drum in the respective shaft support openings, the free ends of the respective projecting pieces abut the peripheral surfaces of each of the respective bearing members to fix the frame within the housing, the distance between the peripheral surface of the drum member of the rotary drum and the peripheral surface of the sleeve of the developing device being set as required.

4,478,508

AUTOMATIC CONTINUOUS MEDIUM SETTING DEVICE

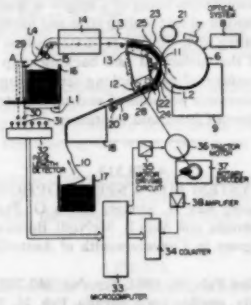
Akinori Kato, Kusatsu, and Yoshihiro Chujo, Otsu, both of Japan, assignors to Fujitsu Limited, Kawasaki and Toray Industries, Inc., Tokyo, both of, Japan

Filed Nov. 10, 1982, Ser. No. 440,561

Claims priority, application Japan, Nov., 1981, 56-181835

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **8 Claims**



1. An automatic continuous medium setting device having a delivery passage with a terminal end, comprising:

delivery means for feeding a continuous medium along the delivery passage, the continuous medium having a top end;

a medium treating zone arranged along the delivery passage;

a medium accumulating zone arranged at the terminal end of the delivery passage;

an initial setting zone, for placing the continuous medium in a temporary setting position, disposed before the medium treating zone on the delivery passage; and

medium feed quantity determining means for determining the feed quantity of the continuous medium during the delivery when the continuous medium is set at a predetermined position in relation to the medium treating zone and the top end of the continuous medium is then fed from said temporary setting position to the accumulating zone, said medium feed quantity determining means being connected to said delivery means.

4,478,509

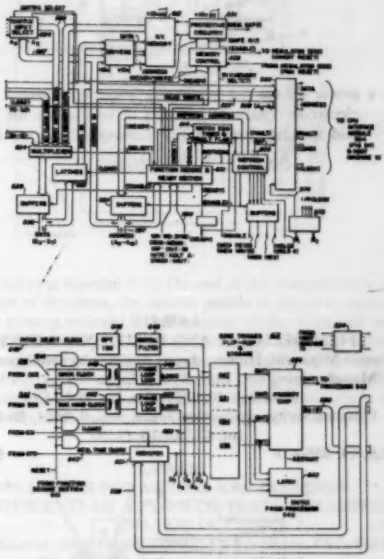
CONTROL SYSTEM AND INTERFACE FOR ELECTROSTATOGRAPHIC MACHINES

John W. Daughton; Gary A. Gray; Stephen A. Wilczek, all of Fairport, and Edward Steiner, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 677,473, Apr. 15, 1978, abandoned. This application Apr. 10, 1978, Ser. No. 894,470

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 C **7 Claims**



1. In a reproduction machine having a plurality of components which cooperate with one another and a photosensitive member to electrostatically produce copies on support material, the improvement comprising:

a controller for operating said machine components said controller including a memory section and a processor for addressing said memory section to operate said machine components;

interface means for transferring control data between said machine components and said controller;

means for suspending operation of said processor;

means for accessing said memory section directly under control of the interface to obtain current control data for operating said machine components; and

clock means for producing clock pulses which periodically actuate said suspension means, said clock pulses being derived in synchronism with machine operation.

4,478,510

CLEANING DEVICE FOR MODULATION CONTROL MEANS

Haruo Fujii, and Yujiro Ando, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,539

Claims priority, application Japan, Dec. 16, 1981, 56-203333; Jan. 14, 1982, 57-4308

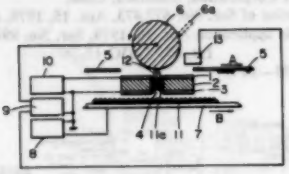
Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **16 Claims**

1. An apparatus for controlling a flow of charged particles, comprising:

a source for generating charged particles;

a control member having means for defining an opening, said control member controlling the passage of charged particles from said charged particle source by an electric field formed in said opening; and



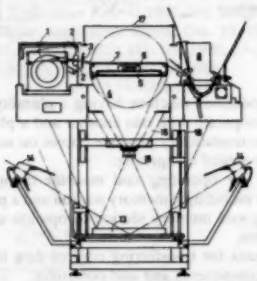
a power source for generating a spark discharge from an electrode constituting a part of said means for defining said opening of said control member to clean said opening.

4,478,511

FILM DELIVERY AND POSITIONING DEVICE

Yoshio Miyauchi, Hikone, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 20, 1982, Ser. No. 400,163
Claims priority, application Japan, Sep. 9, 1981, 56-142802
Int. Cl.³ G03B *29/00*
U.S. Cl. 355—28 5 Claims



1. In a film delivery and positioning device in a copying camera for delivering predetermined lengths of unexposed film to a photographic station, aligning each length with the optical axis of the camera, exposing the film to light, and feeding the exposed film to a developing station, the improvement wherein said photographic station comprises:

film holding means arranged for receiving and holding film lengths thereon in an upwardly facing first position;

feed means for feeding single film lengths onto said film holding means in said first upwardly facing position;

rotating means for rotating said film holding means into a second position wherein said film faces downward toward the lens of the camera on the photographic axis thereof for exposing the film, and for after exposure, rotating said film holding means back to said first position with the exposed film facing upwardly; and

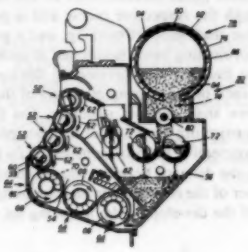
transfer means associated with said film holding means for transferring the exposed film from said film holding means to the developing station.

4,478,512

TONER CARTRIDGE FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

John D. Zoltner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1983, Ser. No. 493,464
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD 10 Claims



1. An apparatus for storing a supply of marking particles therein including:

a container defining a chamber for storing the marking particles therein and having an opening in the surface thereof for the discharge of the marking particles therefrom;

a flexible sealing strip having a portion thereof secured removably to said container sealing the opening in the surface thereof to prevent the discharge of the marking particles therefrom, said sealing strip being folded in juxtaposition; and

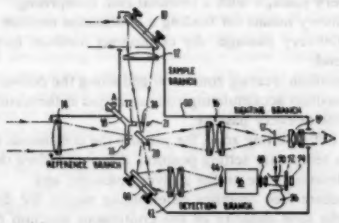
a flexible backing strip being of a length at least equal to the unfolded length of said sealing strip and having the surface of said sealing strip folded in juxtaposition secured to a portion of the surface of said backing strip with the remaining surface of said backing strip being arranged to receive successive portions of said sealing strip during the removal thereof from said container.

4,478,513

OPTICAL SYSTEM FOR A SPECTROPHOTOMETER

David R. Skinner; Rex A. Stokes; Lewis O. Freeman, all of Victoria, Australia, and Alan R. McNeill, Boroko, Papua New Guinea, assignors to Commonwealth of Australia, Canberra, Australia

Filed Feb. 18, 1982, Ser. No. 349,702
Claims priority, application Australia, Feb. 24, 1981, PE7726
Int. Cl.³ G01J *3/08, 3/42*
U.S. Cl. 356—323 10 Claims



1. An optical system for a spectrophotometer said system having a first optical branch for forming an image from a sample and a second branch for forming an image from a reference target, a splitter means for directing a portion of said image formed by the first optical branch to an eye piece and to

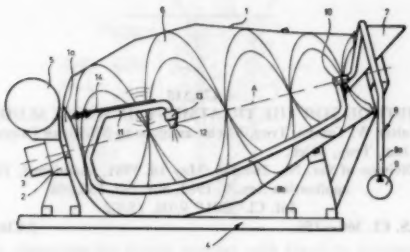
a detecting means and for directing a portion of said image formed by said second optical branch to said eye piece and to said detecting means and a shutter means for sequentially allowing the image formed by the first branch to be received by said splitter means and the image formed by said second branch to be received by said splitter means.

4,478,514

VIBRATING CONCRETE MIXER

Gerhard Hudelmaier, Ulm, Fed. Rep. of Germany, assignor to Ingrid Hudelmaier, Ulm, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,576
Int. Cl.³ B28C *5/20, 7/12*
U.S. Cl. 366—2 **18 Claims**



1. A concrete mixer comprising:
a rotatable drum;
means for rotatably driving the drum about an axis of rotation;
a water conduit having an entrance outside the drum and an exit inside the drum; and
means responsive to water flowing through the conduit to the exit for transferring vibrations to the inside of the drum.

18. A method for mixing concrete constituents in a drum comprising the steps of:
introducing the dry concrete constituents into the drum;
separately introducing the water constituent into the drum; and
converting some of the energy of the water being introduced into the drum into vibrations in an elastic member in contact with the constituents to promote mixing thereof.

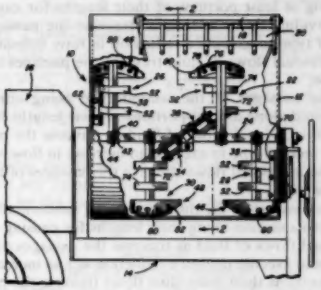
4,478,515

MORTAR MIXER WITH TRIPLE EIGHT MIXING ACTION

Robert A. Tobin, Rochester, N.Y., assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Sep. 27, 1983, Ser. No. 536,256
Int. Cl.³ B28C *5/14*; B01F *7/04*
U.S. Cl. 366—67 **5 Claims**

1. In a mixer having a horizontally disposed mixer drum and a horizontally disposed rotatable shaft mounted in the drum and being rotatably driven, that improvement comprising a plurality of paddles mounted in longitudinally and circumferentially spaced relation on the shaft, each of said paddles including a radially extending support arm rigid with the shaft, a blade assembly at the outer end of each arm and including an outer edge generally conforming with the interior surface of the drum, the endmost blade assemblies including a radially extending blade parallel with and disposed adjacent the inner end surfaces of the drum, each blade assembly including an elongated blade member having an arcuate outer edge generally conforming with the interior surface of the drum and inclined at an angle of approximately 35° relative to a plane perpendicular to the longitudinal axis of said shaft to cut into material in the drum at an angle of approximately 35° in relation to said plane thereby imparting a horizontal vector of force to the material greater than the vertical vector of force imparted to the material to reduce the power required to rotate the shaft by reducing the lifting force exerted on the material, said shaft including six paddles mounted thereon with the two central paddles being substantially aligned with each other on opposite sides of the shaft whereby the mixing action is duplicated in each end portion of the drum with the outermost



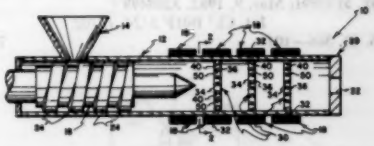
paddles moving material from the end of the drum halfway to the center of the drum, the second paddle in sequence during rotation moving material from the center of the drum halfway toward the end and the third paddle in the sequence during rotation of the shaft cutting the resulting pile into two parts and pushing one part of the pile toward the opposite end with the above sequence occurring simultaneously at both ends of the drum for each revolution of the paddle shaft.

4,478,516

APPARATUS FOR MIXING AND BLENDING CONSTITUENTS OF A FLOW OF THERMOPLASTICS MATERIAL

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed Sep. 30, 1982, Ser. No. 428,907
Int. Cl.³ B29B *1/06*
U.S. Cl. 366—87 **10 Claims**



1. A device for mixing and blending constituents of a fluid as the fluid is fed along a path of flow, comprising:
(a) structure defining a confined path of flow for movement of a fluid from an upstream location along the path of flow to a downstream location along the path of flow;
(b) mixing means:
(i) for positioning across the path of flow at a location intermediate the upstream and downstream locations, and having an upstream side near the upstream location, and a downstream side near the downstream location;
(ii) for defining a plurality of elongate passages of substantially round cross section, with the passages extending in directions which substantially parallel the direction of the path of flow, with at least one of the passages being of a first type, with at least one other of the passages being of a second type, with at least another of the passages being of a third type, and with the passages of the first, second and third types extending from the upstream side of the mixing means to the downstream side thereof for causing a flow of fluid moving along the

path of flow to divide itself in the vicinity of the upstream side of the mixing means into a plurality of individual flows for travel through the passages of the mixing means, with each of the individual flows traversing a separate one of the passages, discharging therefrom and recombining with the other individual flows in the vicinity of the downstream side of the mixing means;

(c) the passages of the first type being divergently tapered along at least portions of their lengths for causing such individual flows of fluid as traverse the passages of the first type to execute a reduction in flow velocity as these individual flows of fluid traverse the passages of the first type;

(d) the passages of the second type being convergently tapered along at least portions of their lengths for causing such individual flows of fluid as traverse the passages of the second type to execute an increase in flow velocity as these individual flows traverse the passages of the second type;

(e) the passages of the third type being substantially uniform in cross section along their lengths for causing such individual flows of fluid as traverse the passages of the third type to execute neither a reduction nor an increase in flow velocity as these individual flows traverse the passages of the third type; and,

(f) the passages of the first, second and third types being arranged in a closely spaced array with passages of the first and second types being intermingled in the array among passages of the third type whereby, when flows of fluid discharge therefrom and recombine, the three different velocities at which flows discharge from the passages of the first, second and third types causes these flows to execute effective mixing actions as the flows recombine in the vicinity of the downstream location.

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PROCESS AND GRAVITY FEED MIXER FOR MIXING BULK MATERIALS IN A CONTAINER

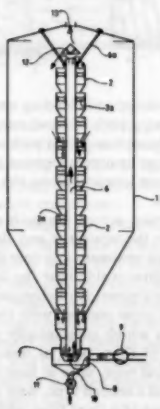
Hans Hoppe; Helmut Bercx, both of Vogt, and Wolfgang Siegel, Ravensburg, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Aug. 13, 1982, Ser. No. 408,197

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132591; Mar. 9, 1982, 3208499

Int. Cl.³ B01F *5/24, 13/02*

U.S. Cl. 366—101 **7 Claims**



1. A gravity feed mixer comprising a silo container having an inlet at its top for feeding bulk material thereto, a conical bottom having an outlet for said bulk material and built-in components for removal of bulk material quantities from said silo container at various levels and the subsequent admixture of the same, comprising a plurality of identical funnels, each comprising a cylindrical tube having a conical bottom and having a substantially smaller diameter than the diameter of said silo container, said funnels being arranged one above the other along the central axis of the silo, said funnels extending one within the other so that the intake cross-section of each funnel lies at approximately the same height as the egress cross-section of the next higher funnel and that the angle of the funnel opening is equal to or less than that required for the total mass flow of the bulk material at the corresponding level, but sufficient to provide partial quantity of material to be removed.

4,478,518

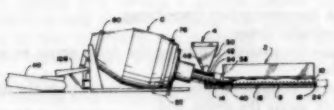
METHOD FOR THE TREATMENT OF WASTE SLUDGE

Walter W. Tomyn, Troy, Mich., assignor to Michigan Disposal, Inc., Troy, Mich.

Division of Ser. No. 264,266, May 18, 1981, abandoned. This application Sep. 9, 1983, Ser. No. 530,698

Int. Cl.³ B01F *9/06, 15/02*

U.S. Cl. 366—156 **2 Claims**



1. A method for the treatment of sludge to cause its solidification and render it suitable for use as landfill by admixture of chemicals therewith, said method comprising the steps of:

feeding the sludge into a sludge hopper positioned adjacent an elongated mixing chamber which is rotated at a controlled rate of rotation about its longitudinal axis and which has an opening at one longitudinal end thereof to provide entrance for the sludge and the chemicals to be mixed and an opening at the other longitudinal end thereof for exit of the sludge and chemicals after they are mixed, said mixing chamber having a generally cylindrical center portion, a generally frustoconical end portion at said one end thereof tapering from said center portion toward said first-mentioned opening and generally frustoconical portion at said other end thereof tapering from said center portion toward said second-mentioned opening, said mixing chamber being oriented with its longitudinal axis canted upwardly from said first-mentioned opening to said second-mentioned opening at an angle of from about 10° to 20° to the horizontal and said mixing chamber having inwardly extending elongated generally helical shaped mixing blades fixedly secured to its inner walls of said cylindrical and frustoconical portions;

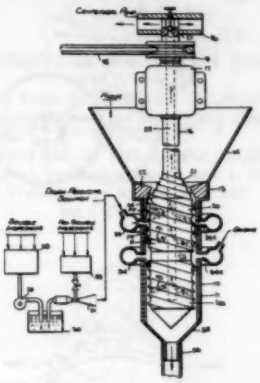
feeding the chemicals into a chemical hopper positioned adjacent said mixing chamber; and

continuously feeding sludge from said sludge hopper and chemicals from said chemical hopper, each at a controlled feed rate, into the first-mentioned opening of said rotating mixing chamber to control the generation of heat in the mixing chamber generated by the combination of sludge and chemicals whereby the sludge and chemicals therein are mixed and caused to move upwardly and longitudinally of the chamber from said first mentioned opening to and then out of said second-mentioned opening.

4,478,519
AUTOMATIC PASTE-PRODUCING APPARATUS

Raul Guibert, 10374 Summer Holly Cir., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 272,344, Jun. 10, 1981,. This application Mar. 19, 1982, Ser. No. 359,768
Int. Cl.³ B01F 7/24, 15/02
U.S. Cl. 366—157 8 Claims



1. Apparatus for mixing powder with liquid to produce a homogeneous paste, said apparatus comprising:

(A) a vertical cylindrical chamber provided with means at its upper end portion to feed the powder therein;

(B) a rotating shaft driving a main helical screw in said chamber, the screw forming the incoming powder into a cylindrical powder film on the inner surface of the chamber at the upper end portion thereof, said shaft having a longitudinal channel therein communicating with a nozzle formed in the screw;

(C) an inlet constituted by a housing surrounding an annular slot in said chamber at a point under said upper end portion to introduce the liquid into said chamber to intermingle with the powder film to produce a paste which is shaped by the screw into a ribbon that is advanced helically toward the lower end of the chamber; and

(D) pump means coupled to the said channel to draw air out of the space between the inner surface of the chamber and the screw to control the amount and size of air bubbles being entrained in the paste to an extent complying with the bubble requirements of the ultimate product, said pump means being constituted by a centrifugal pump driven by said shaft and mounted on the upper end thereof.

4,478,520
COMPOST TURNING AND SHREDDING APPARATUS

Herbert T. Cobey, P.O. Box 154, Galion, Ohio 44835

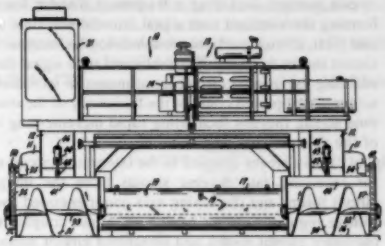
Filed Oct. 1, 1982, Ser. No. 432,292
Int. Cl.³ B01F 15/02
U.S. Cl. 366—345 4 Claims

1. An apparatus for feeding compost into a compost-turning machine, the machine having a straddle frame which supports a rotatable compost-throwing member, a power means for rotating the compost-throwing member, the improvement comprising, in combination;

(a) a pair of augers mounted outboard and ahead of the compost-throwing member, the augers being rotatably mounted to collect compost outboard of the compost-throwing member and depositing it into the path of the compost-throwing member;

(b) means for rotating the augers;

(c) means for raising and lowering the augers relative to the compost windrow; and

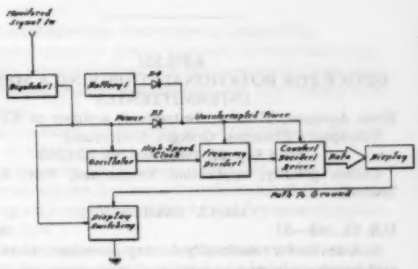


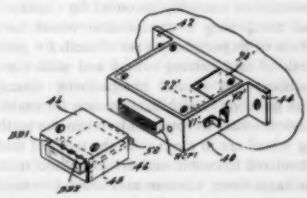
(d) cowling means around each auger to act as a shield against any compost material which may be thrown into the air by the rotating action of the augers.

4,478,521
DIGITAL TIME METER

Dennis W. Evans, Royal Oak, and John F. Ellis, Madison Heights, both of Mich., assignors to Perfection Electronic Products Corp., Royal Oak, Mich.

Filed Nov. 9, 1981, Ser. No. 319,697
Int. Cl.³ G04F 8/00
U.S. Cl. 368—8 10 Claims





1. A digital time meter for sensing the presence of and for timing a monitored electrical signal, for accumulating the total time the monitored electrical signal is present, for displaying the total time, and for retaining the total time when the monitored electrical signal is absent, comprising:

crystal oscillator circuit means for producing a periodic unit time signal;

integrated circuit means coupled to the crystal oscillator circuit means for cumulatively counting periods of the unit time signal, decoding the accumulated period count to facilitate transmission and display of said count, and generating driving signals, some encoded with said count;

said oscillator circuit means comprises: a first circuit portion

including a crystal oscillator producing a standard time signal that is a multiple frequency of the unit time signal frequency and a second circuit portion coupled to the first circuit portion, including a frequency divider for transforming the standard time signal into the unit time signal, said first circuit portion, coupled to the manual input circuit means to transmit the standard time signal thereto, enabling the manual circuit input means to increment the accumulated period count at the frequency of the standard time signal, thereby facilitating rapid incrementing of the of the accumulated period count;

digital display means coupled to the integrated circuit means for receiving said driving signals from the integrated circuit means and displaying said count encoded therein;

a voltage regulator circuit having an output coupled to the oscillator circuit means and integrated circuit means and an input coupled to a monitored electrical signal, said voltage regulator circuit regulating the monitored electrical signal when present to produce power to operate a digital time meter;

internal power source means coupled to the integrated circuit means and conditioning circuit means for supplying power to the integrated circuit means to retain the accumulated period count during loss of power from the conditioning circuit means; and

the oscillator circuit means and integrated circuit means cooperating to increment the accumulated period count only when the monitored electrical signal is present, thereby timing and accumulating the total time the monitored electrical signal is present.

4,478,522

DEVICE FOR ROTATIONALLY DRIVING A MEMBER INTERMITTENTLY

Ernst Ammann, Moutier, Switzerland, assignor to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,388

Claims priority, application Switzerland, Nov. 5, 1981, 7069/81

Int. Cl.³ G04B *19/20*

U.S. Cl. 368—37 **3 Claims**

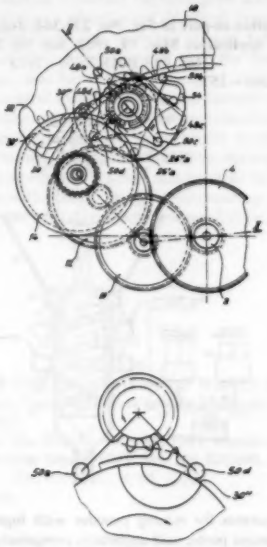
1. A device for rotationally driving a member intermittently, said member carrying a plurality of teeth, comprising:

a driving wheel mounted for rotation about an axis and having on its periphery two juxtaposed teeth and first immobilizing means;

a transmission assembly mounted for rotation about its axis and comprising a transmission wheel having over the whole of its periphery a set of teeth for meshing with the teeth of said driving wheel and with the teeth of said member, and second immobilizing means cooperating with said first immobilizing means for enabling said transmission wheel to rotate only when the teeth of said driving wheel are in mesh with the teeth of said transmission wheel and to enable said driving wheel to rotate freely at the same time; wherein said second immobilizing means comprises:

n stud members, where $n \geq 2$, fixed for rotation with said transmission wheel and disposed on the same axis of rotation as said transmission wheel, said stud members being angularly spaced apart by (360°/n), and wherein said first immobilizing means comprises:

a circular flange fixed for rotation with said driving wheel, having the same axis as said driving wheel and being disposed at a level which is the same according to the direction of the axes of rotation of said stud member, said flange being provided with two recesses so that one of said stud members can pass through said flange during its rotation under the action of the meshing of said transmission wheel with the teeth of said driving wheel, whereas said stud members or two of said stud members abut



against said flange outside said recesses when there is no meshing.

4,478,523

SPEECH SYNTHESIZER TIMEPIECE WITH MINIMAL NUMBER OF KEYS FOR TIME ANNOUNCEMENTS

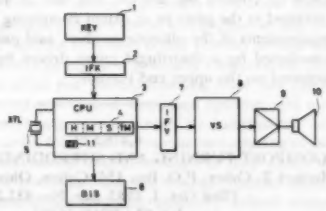
Yutaka Ikemoto, Nara, and Hiroshi Tsuda, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1982, Ser. No. 360,674

Claims priority, application Japan, Mar. 24, 1982, 56-43661; Mar. 26, 1982, 56-44946; Mar. 26, 1982, 56-44947; Mar. 26, 1982, 56-44949

Int. Cl.³ G04B *21/08*; G04C *19/00*

U.S. Cl. 368—63 **3 Claims**



1. A timepiece capable of providing at least two pieces of time-related information comprising:

speech generation means for providing an audible message;

speech instruction key means for activating said speech generation means;

display means for providing a visual display of at least one of said at least two pieces of information;

detection means for detecting actuation of said speech instruction key means; and

means for enabling said speech generation means to provide an audible message indicative of one of said at least two pieces of information and said visual display to provide a

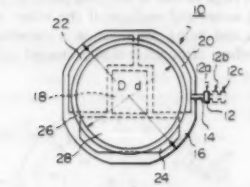
visual display of the other of said speech at least two pieces of information according to the state of said instruction key means as detected by said detection means.

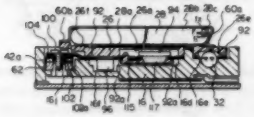
4,478,524

ARRANGEMENT OF ANALOG-TYPE ELECTRONIC WRISTWATCH

Mitsuo Saitoh; Yasuo Kamiyama, and Mitsuhiro Murata, all of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,037
Claims priority, application Japan, Apr. 1, 1980, 55-42109; Apr. 3, 1980, 55-43871; Apr. 8, 1980, 55-45242
Int. Cl.³ G04C *23/02*
U.S. Cl. 368—204 **15 Claims**





1. An analog-type electronic wristwatch structure comprising:

a main plate having a central cutout area and first to third cutout areas surrounding said central cutout area;

a wheel train mechanism disposed in said central cutout area;

a time correction mechanism disposed in said first cutout area;

an electronic circuit block disposed in said second cutout area;

an electro-mechanical transducer disposed in said cutout third area;

a flat-type lithium battery disposed over said wheel train mechanism, said time correction mechanism said electronic circuit block and said electro-mechanical transducer,

the relation between the diameter d of said lithiuum battery and the maximum diameter D said main plate being given by $0.65 \leqq d/D \leqq 0.95$;

a battery receiving member made of an insulating material and disposed over said main plate to support one side of said battery, said battery receiving member having a recess for accomodating the driving coil of said electro-mechanical transducer; and

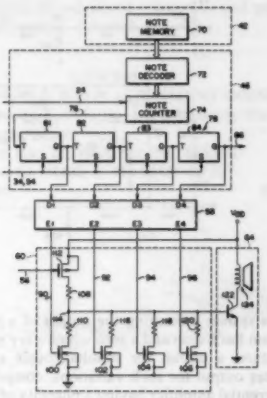
a battery retaining spring for urging the other side of said battery toward said battery support member to retain said battery in a fixed place.

4,478,525

MUSICAL ENVELOPE CONTROL DEVICE

Tetsuo Yamaguchi, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 30, 1981, Ser. No. 325,868
Claims priority, application Japan, Dec. 2, 1980, 55-169850
Int. Cl.³ G10F *1/00*
U.S. Cl. 368—273 **12 Claims**



1. A musical envelope control device comprising:

(a) memory means for storing a plurality of note data including first musical performance data representing note pitch and second musical performance data representing note duration;

(b) read-out means for selecting and for reading out the note data from said memory means;

(c) first processing means, connected to said memory means, for receiving the first musical performance data and generating a tone signal according to said first musical performance data;

(d) second processing means, connected to said memory means, for receiving the second musical performance data and dividing said note duration into a predetermined number of components irrespective of the length of note duration, and generating for each component a coded signal comprising a plurality of bits;

(e) decoder means, connected to said second processing means, having a predetermined input/output conversion mode corresponding to a desired envelope waveform, for converting said coded signals in accordance with said input/output conversion mode and for generating voltage signals which vary for the various components of note duration; and

(f) envelope control means, connected to said first processing means and said decoder means and receiving the tone signal and the voltage signals, for producing a stepped, sound pressure signal representing a stepped musical envelope waveform whose level changes in a stepped manner in response to changes in the voltage signals, whereby said sound pressure signal and said tone signal are used to generate a sound signal, each note of which has substantially the same envelope waveform irrespective of the duration thereof.

4,478,526

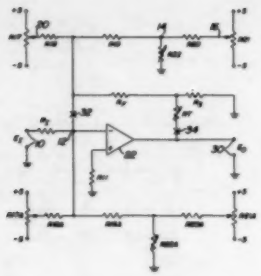
Patent Not Issued For This Number

4,478,527

TEMPERATURE COMPENSATION FOR ZERO AND SPAN CHANGES IN A MEASUREMENT CIRCUIT

George C. Mergner, Glenside, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Dec. 2, 1982, Ser. No. 446,122
Int. Cl.³ G01K 7/00
U.S. Cl. 374—172 **4 Claims**



1. In a system measuring the output of a transducer whose calibration has a span and a zero which vary with changes in its temperature, a circuit for simultaneously compensating the transducer output for such variations, comprising:

a differential amplifier having a plurality of inputs connected through input resistors to a summing junction at an inverting input of said amplifier and having a negative feedback path connected from an output of said amplifier to said inverting input;

a first of said input resistors connecting the transducer output to said summing junction;

a second of said input resistors connecting a compensating signal to said summing junction, said compensating signal being so generated that it varies from a certain value at a reference temperature with changes in the temperature of the transducer, said variations being of magnitude such that the output of said amplifier at the zero calibration point is insensitive to temperature changes at the transducer;

a third of said input resistors connecting a fixed signal to said summing junction, said fixed signal being adjusted to correspond to the value of said compensating signal at said reference temperature with an opposite polarity so as to cancel said compensating signal when the transducer is at said reference temperature, thereby compensating said transducer output for changes in zero due to temperature changes at said transducer; and

means for varying said negative feedback circuit with changes in said transducer temperature to compensate changes in span for changes in transducer temperature.

4,478,528

WIRE MATRIX PRINT HEAD ASSEMBLY

Donald G. Hebert, 9412 Cherry Hills La., San Ramon, Calif. 94583, assignor to Donald G. Hebert and Helmut Falk, both of Sunnyvale, Calif.

Continuation-in-part of Ser. No. 885,186, Mar. 10, 1978, Pat. No. 4,185,929, and Ser. No. 887,927, Mar. 17, 1978, Pat. No. 4,230,412. This application Sep. 24, 1979, Ser. No. 78,289
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 **20 Claims**

1. A wire matrix print head assembly comprising:

a plurality of elongated printing wire members having print end portions and actuating end portions and being movable between a print position and a non-print position;

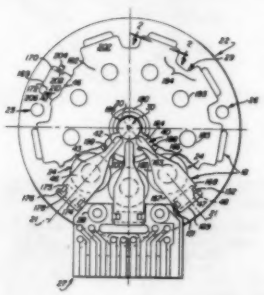
an elongated wire housing means having a central axis and a print end portion and an actuating end portion for supporting said wire members about said central axis for movement between the non-print position and the print position;

a rigid metallic plate means having a central opening for receiving and rigidly fixedly supporting an intermediate portion of said wire housing means;

a plurality of electromagnetic means for causing individual actuation of said printing wire members and being rigidly fixedly mounted on said metallic plate means in circumferentially spaced relationship in a circular array in radially outwardly spaced relationship to said elongated wire housing means;

each electromagnetic means comprising a radially innermost pole portion having an axially facing outer end surface and a radially outermost pole portion having axially facing outer end surface and the pole portions extending axially from said metallic plate means toward said actuating end portion of said elongated wire housing means, and further comprising an electrical coil device operatively associated with said radially innermost pole portion;

a plurality of armature members being located axially outwardly of an operatively associated with said electromagnetic means and said printing wire members for causing operation of said printing wire members by pivotal movement about an edge of one of the pole portions toward the axially facing outer end surface of the other one of the pole portions and being mpunted in a circular array in radially extending circumferentially spaced relationship;



each armature member being radially aligned with and extending between one of said electromagnetic means and the actuating end portion of one of said elongated printing wire members;

an armature retainer plate means being centrally rigidly adjustably connected to said actuating end portion of said elongated wire housing means and having a radially outwardly extending flange portion located axially adjacent and in juxtaposition to said armature members and being rigidly supported by said electromagnetic means for retaining said armature members in operative association with said actuating end portions of said elongated wire members and said electromagnetic means;

said retainer plate means comprising:

a circumferentially continuous substantially rigid solid annular center portion;

a circumferentially continuous relatively rigid solid intermediate annular flange portion intergral with and extending radially outwardly from said center portion and being resiliently deflectable relative thereto;

a plurality of circumferentially spaced individual flange portions located on the outer periphery of and integral with and extending radially outwardly from said intermediate annular flange portion, there being one of such individual flange portions located in alignment with and juxtaposition to each of said outer pole portions;

support surface means on each of said individual flange portions being abuttingly engageable with the outer end

surface of the associated outer pole portion for fixedly axially locating said individual flange portions relative to the associated outer pole portion;

a plurality of armature retaining slot means arranged and located on the outer periphery of said armature retainer plate means in a circular array for receiving and retaining radially outermost portions of said armature members in operative relationship with the associated electromagnetic means without applying any moment of force to said armature members tending to cause pivotal movement away from the axially facing outer end surface of the other one of the pole portions; and

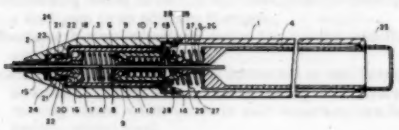
said armature retaining slot means being located adjacent said support surface means and being defined by a pair of circumferentially spaced parallel side surfaces and a transverse connecting surface extending between said side surfaces and said outer end surface of said outer pole portion for receiving a radially outermost portion of the associated armature member and confining the associated armature member during pivotal movement between the non-print position and the print position.

4,478,529

WRITING IMPLEMENT WITH AUTOMATIC LEAD PROJECTION

Yasumasa Morio, Osaka, Japan, assignor to Kabushiki Kaisha Sakurakurepasu, Osaka, Japan

Filed May 14, 1982, Ser. No. 378,041
Claims priority, application Japan, May 19, 1981, 56-76283
Int. Cl.³ B43K *21/02, 21/16*
U.S. Cl. 401—53 **9 Claims**



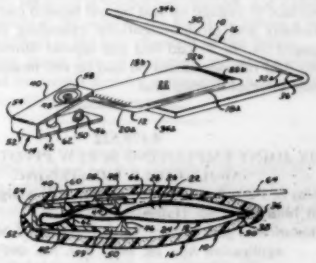
1. A writing implement utilizing lead and in which the lead is automatically advanced by applying pressure to the lead greater than normal writing pressure and subsequently releasing said pressure to effect said automatic advance, comprising a tubular main body, an inner frame and a lead protecting tube axially slidable in said body, a first coil spring at a rear portion of said body biasing said frame forwardly, a second coil spring within said frame and disposed rearwardly of said protecting tube to bias said protecting tube forwardly, a clutch assembly in said frame operable to permit advance of said lead but preventing retraction of said lead, said protecting tube having a lead holder for holding said lead with a frictional force, said protecting tube having a rear end portion disposed in said frame, said second coil spring biasing said rear end portion forwardly, said rear end portion having an outer peripheral surface which is tapered and which increases in diameter toward its rear end, at least one rolling member movable with said frame and in contact with said tapered surface, a guide means on said body spaced from said tapered surface, said rolling member being disposed between said guide means and said tapered surface, said guide means having a guide portion in which said rolling member is allowed to be displaced radially inwardly and outwardly, said frame having a first position in said body wherein said rolling member is in a first position located at said guide portion such that said rolling member is displaced radially outwardly at said guide portion, said frame being slidable into said body to a second portion when pressure greater than normal writing pressure is applied to the lead, said rolling member moving radially inwardly and then rearwardly of said guide portion when said pressure is applied to a second portion rearwardly of said guide portion, whereby upon release of said pressure, said first and second coil springs are operable to move said frame forwardly to said first position at which said rolling member is disposed at said guide portion to move radially outwardly such that the protecting tube moves forwardly relative to said frame to withdrawn the lead relative to said frame as said lead is grasped with a frictional force by said lead holder, with subsequent advancement of said frame causing said rolling member to be moved radially inwardly as said rolling member moves forwardly of said guide portion whereupon said protecting tube is moved rearwardly relative to said frame as said lead is held by said clutch assembly and the frictional force of said lead holder is overcome, whereby the lead is automatically advanced relative to said protecting tube when said pressure is released.

4,478,530

SCRUB SPONGE WITH ALIGNMENT BOSSES

Ronald R. Van Overloop, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 25, 1983, Ser. No. 488,572
Int. Cl.³ B43K *5/14;* A45D *40/26*
U.S. Cl. 401—134 **15 Claims**



1. A scrub sponge, comprising:

a packet having a rupturable wall and a closed chamber containing a liquid scrub agent;

a cover of foam material having a cavity to receive said packet and enclosing said packet; and

a puncture member intermediate said cover and the packet and having a pair of generally aligned and spaced arms on opposed sides of the packet beneath the cover, hinge means connecting said arms adjacent one end of the packet, a sharp projection on each of the arms directed toward the packet to pierce the wall when the arms are pressed toward each other to release the scrub agent into the cover, with the projection on one of the arms being slightly longitudinally offset from the projection on the other arm, and an alignment boss on each of the arms intermediate the projections and the hinge means, said bosses being aligned and having an oppositely directed tapered surface facing toward the packet, and said bosses nearly engaging when the arms are pressed toward each other to guide the projections.

4,478,531

RACK AND PINION BALL JOINT ASSEMBLY

Dale A. Levinson, Hazelwood, and Leonard R. Ketterer, Pacific, both of Mo., assignors to Moog Automotive, Inc., St. Louis, Mo.

Filed Oct. 12, 1982, Ser. No. 433,776
Int. Cl.³ F16C *11/06*
U.S. Cl. 403—77 **5 Claims**

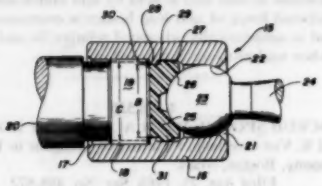
1. The arrangement of a ball joint assembly prior to incorporation in a rack and pinion vehicle steering system which comprises:

(a) a housing having a first open end and an adjacent internal bearing seat, a first fixed surface forming a circumferentially extending and radially inwardly directed shoulder in the housing spaced axially along said housing from said bearing seat, and internal threads extending inwardly from

a second open end to an inner end thread such that said inner end thread provides a second circumferentially extending and radially inwardly directed fixed shoulder;

(b) a tie rod headed end seated on said internal bearing seat and spaced from said first and second fixed surfaces; and

(c) tie rod headed end retaining means for holding said



headed end on said internal bearing seat, said retaining means being deformable and presenting a further bearing surface to engage on said tie rod headed end and having a radially and circumferentially extending projection engaged on one of said first and second shoulders for holding said retainer means on said tie rod headed end against said internal bearing seat.

4,478,532

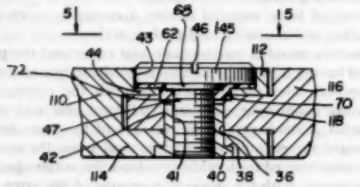
BOX JOINT EMPLOYING SCREW PIVOT PIN FOR ADJUSTABLE TIGHTENING

Nicholas S. Puro, Upper Saddle River, N.J., assignor to Microdent Industries, No. Haledon, N.J.

Continuation-in-part of Ser. No. 382,291, May 26, 1982,. This application Apr. 28, 1983, Ser. No. 489,585

Int. Cl.³ B25B *7/06*; F16C *11/04*

U.S. Cl. 403—157 **20 Claims**



1. An improved box joint for pliers and the like in which the jaw portions are pivotally retained and movable in a prescribed plane normal to a pivot pin, this box joint including:

(a) a first jaw member that is characterized as having a central tongue portion with outwardly facing surfaces smoothly finished and parallel to the plane of movement;

(b) a second jaw member with substantially like portions providing first and second outer members and forming the outer sides of a box-like aperture in said second jaw member and with the facing inner surfaces of the aperture finished, and in the assembled condition the outer facing surfaces of the central tongue portion of the first jaw member are in a sliding relationship with the facing inner aperture surfaces of the first and second outer members of the second jaw member;

(c) a counterbore and a through bore both having a predetermined axis formed in said first outer member of the second jaw and with said counterbore and through bore transverse of the plane of movement of the jaw members;

(d) a through bore formed in and through the central tongue portion of the first jaw member, said through bore in axial coincidence with the through bore in the first outer member of the second jaw member;

(e) a pivot pin bushing having a first diameter adapted to be seated in the counterbore of the first outer member and a second reduced outer diameter shank portion sized to be a tight fit in the remaining through bore of this first outer member of the second jaw member and with said shank portion of said bushing entering into and nearly through the through bore in the portion of the first jaw and providing a pivot for said first jaw member, said pivot pin bushing having an axially threaded bore;

(f) a counterbore formed in the second outer member of the second jaw member and extending a determined distance from the outer surface of the second member of the second jaw, and a smaller diameter bore in axial coincidence with said counterbore and extending through the remainder of the thickness of the second outer member, said counterbore extending toward the central tongue portion sufficiently to establish a thin flexure portion about one thirty-second of an inch in thickness and sufficiently defelectable for said flexure portion to be moved for tightening the box joint, and

(g) a securing screw having a head adapted to seat and move the second outer member flexure portion toward the central tongue and with the shank of said screw providing the pivot portion immediately interior of the securing screw and in coincidence with the axis of said pivot pin bushing, the thread portion of said securing screw entering into the threaded portion of the pivot pin bushing and with manipulation the screw is tightened to bring the box joint members into the desired sliding relationship of one to another, said adjustment reducing and/or eliminating any developed and unwanted play of and in the joint.

4,478,533

SYNTHETIC SEAWEED

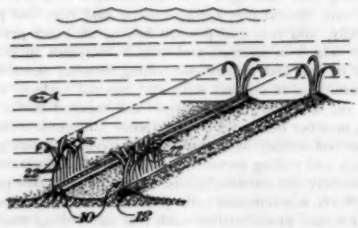
William L. Garrett, 100 Dickinson La., Wilmington, Del. 19807

Continuation-in-part of Ser. No. 178,856, Aug. 18, 1980, Pat. No. 4,374,629, which is a continuation-in-part of Ser. No. 6,567, Jan. 26, 1979, Pat. No. 4,221,500. This application Sep. 20, 1982, Ser. No. 420,310

The portion of the term of this patent subsequent to Sep. 9, 1997, has been disclaimed.

Int. Cl.³ E02B *3/04*

U.S. Cl. 405—24 **20 Claims**



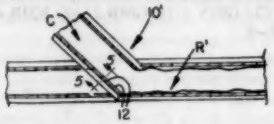
1. Synthetic seaweed for use in inhibiting coastal erosion comprising an elongate anchor, a plurality of flexible strips secured to the elongate anchor extending outwardly therefrom and terminating at free end portions, buoyant tabs of foam material secured to the exterior of at least the free end portions of at least some of the strips, and an antifouling inhibitor on the outside surfaces of the strips.

4,478,534

FLOOD CONTROL SYSTEM

Ivy McIlwain, 201 Bryat St., NW., Washington, D.C. 20001

Filed Apr. 7, 1981, Ser. No. 250,936
Int. Cl.³ E02B 7/20, 7/26, 7/36
U.S. Cl. 405—96 1 Claim



1. A flood control and waterway diverting means comprising:

housings embedded in banks along both sides of a portion of a waterway and further housings embedded in both sides of banks along a portion of a second waterway which second waterway intersects said first waterway, a substantial portion of said housings being located beneath the normal water level of the waterways;

a multiplicity of floodgates mounted in said housings to move up and down for containing water in both waterways;

some of said floodgates spanning said first waterway for diverting at least a portion of the water from said first waterway into said second waterway when they are activated;

interlocking means on each of said floodgates for connecting a floodgate to an adjacent floodgate;

floodgate hydraulic moving means for moving said floodgates up and down; and

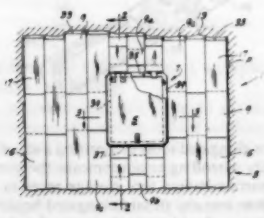
water level sensing float means connected to said floodgate hydraulic moving means for actuating said hydraulic moving means when water in said waterway reaches a predetermined level.

4,478,535

MINE STOPPING WITH MAN DOOR AND DOOR FRAME ASSEMBLY

John M. Kennedy, and William R. Kennedy, both of P.O. Box 38, Taylorville, Ill. 62568

Filed Dec. 27, 1982, Ser. No. 453,822
Int. Cl.³ E21F 1/14
U.S. Cl. 405—132 2 Claims



1. A mine stopping having a man door and door frame assembly therein, said stopping comprising:

a plurality of elongate extensible panels extending vertically in side-by-side relation from the floor to the roof of a passageway in a mine, each panel comprising a first elongate member constituting a lower member of the panel and a second elongate member constituting an upper member of the panel, each of said panel members being a sheet metal member of channel shape in cross section having a web and flanges at opposite sides of the web, one of said members having a telescoping sliding fit in the other with the webs of the members in engagement, the one member constituting the inner member and the other constituting the outer member of the panel, a plurality of the panels being installed in the passageway with the side flanges of the outer members generally in engagement,

said frame being a rectangular frame having a top, bottom and side channel members, said frame being adapted to be mounted in an opening in the mine stopping, each of said channel members having a web, a rear flange and a forward flange, the flanges of the top channel member extending upwardly, the flanges of the bottom channel member extending downwardly, the flanges of the side channel members extending outwardly,

hinge means hingedly mounting the door on the frame to swing on an axis between a closed position engaging a face of the frame all around the frame and an open position swung away from the frame,

said stopping comprising a plurality of said panels above the frame having their lower ends received in the top channel, a plurality of said panels below the frame having their upper ends received in the bottom channel, and a plurality of said panels at the sides of the frame including a pair of panels received in the side channels of the frame,

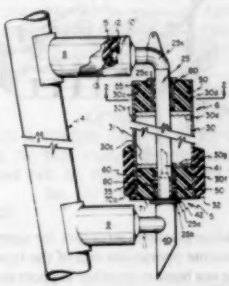
said stopping being free of fastening means between the frame and the panels thereby maintaining the extensibility and contractability of the panels.

4,478,536

ADJUSTABLE LENGTH SHOCK ABSORBING ARRANGEMENT FOR A MARINE STRUCTURE

Glen E. Drewett, P.O. Box 15, Negreet, La. 71460, and Kenneth W. Guynes, Houston, Tex., assignors to Glen E. Drewett, Negreet, La.

Filed Apr. 18, 1983, Ser. No. 486,184
Int. Cl.³ E02B 3/22
U.S. Cl. 405—213 3 Claims



1. A shock absorbing arrangement for marine structures to absorb shock compression and tension comprising:

(a) annular, hollow upper and lower members for securing to an upwardly extending supporting leg of an offshore structure to project therefrom in generally the same plane, each of said members including:

(1) cylinder means axially aligned and projecting from an end of each of said members;

(2) said cylinder means having a smaller diameter than its respective member to provide an annular space therebetween and having a closed end positioned within its respective member;

(3) first yieldable means molded in the annular space to encase said cylinder means to accommodate movement of said cylinder means relative to its respective member;

b. stem means for securing to and extending between said upper and lower cylinder means;

c. cylindrical bumper means;

d. support means supporting said cylindrical bumper means on said stem means for rotation relative thereto; and

e. yieldable means between said cylindrical bumper means and stem means, said yieldable means including an upper spider of yieldable substance and a lower spider of yieldable substance each having an outer annular surface molded adjacent the upper and lower inner surface of said cylindrical bumper with a plurality of legs radiating inwardly in spaced relation to form openings therebetween through each spider, the inner ends of the legs terminating in an annular, central body of yieldable material having a central opening for receiving said stem means therethrough and a rigid, annular reinforcing embedded in and extending longitudinally of said central body; and

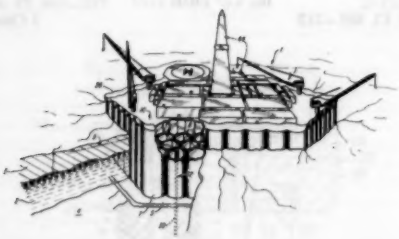
wherein said cylindrical bumper means is defined by an upper section receiving said upper spider, a lower section receiving said lower spider and a central hollow section between said upper section and said lower section.

4,478,537

ARCTIC CAISSON SYSTEM

Jal N. Birdy, Kingwood, and Dilipkumar N. Bhula, Houston, both of Tex., assignors to Brian Watt Associates, Inc., Houston, Tex.

Filed Jul. 2, 1982, Ser. No. 394,783
Int. Cl.[3] E02B *15/02*
U.S. Cl. 405—217 15 Claims



1. A stable marine platform structure for supporting plant or equipment for marine operations and of the type adapted to be supported on the sea bottom or other support surface, comprising:

a continuous base slab for engaging the sea bottom or other support surface;

an interior hexagonal cell structure formed of a plurality of vertically oriented inter-connected cell walls standing upon said base slab;

a substantially vertical perimeter wall adjoining the periphery of said interior cell structure and surmounting said base slab, said perimeter wall being formed of a plurality of inter-connected, arcuate wall segments and a plurality of vertically oriented, planar wall segments, said planar segments formed between the juncture of said arcuate segments and the perimetrical vertices of said interior hexagonal cell structure;

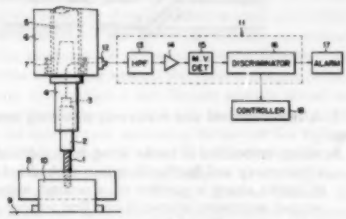
a horizontally oriented, continuous top slab supported upon the upper extremities of said interior cell structure and adjoining said perimeter wall, said top slab being adapted for supporting plant or equipment used in the marine operation.

4,478,538

DEVICE FOR DETECTING TOOL ABNORMALITY

Yoshiaki Kakino, 256-5, Iwakura Hanazono-cho, Sakyo-ku, Kyoto-Shi, Japan, assignor to Yoshiaki Kakino, Kyoto; NF Circuit Design Block Co., Ltd., Yokohama and Showa Tool Co., Ltd., Toyonaka, all of, Japan

Filed Sep. 28, 1982, Ser. No. 426,244
Claims priority, application Japan, Apr. 23, 1982, 57-69354
Int. Cl.[3] G01N *3/58*; G08B *21/00*; B23B *49/00*
U.S. Cl. 408—6 7 Claims



1. A device for detecting tool abnormality, comprising:

coupling means coupled between a tool holder and a rotatable main spindle for normally transmitting rotation of the main spindle to the tool holder, and for repeatedly stopping the transmission of rotation of the main spindle to the tool holder only when a tool abnormality exists, thereby generating elastic waves of a predetermined level;

a transducer for converting the elastic waves into an electrical signal; and

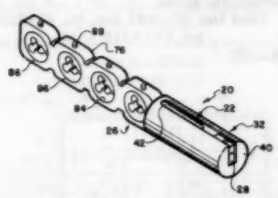
an amplitude discriminator for generating an output signal when the output signal from the transducer surpasses a threshold value.

4,478,539

MULTIPLE TOOL HOLDER WITH RETAINER AND DRIVE SOCKET

Paul J. Prevette, 3910 Admiral Ave., Charlotte, N.C. 28205

Filed Dec. 3, 1980, Ser. No. 212,365
Int. Cl.[3] B23F *1/04*; B23G *1/30*
U.S. Cl. 408—117 4 Claims



1. A holder for elongated tools comprising a set of elongated tools and laterally extending retainer means thereon, an elongated holding portion having tool storage recesses extending longitudinally from one end of said elongated holding portion for selective storage of said tools therein and a drive socket disposed in said one end of said holding portion for selective reception of said tools thereinto for driving use of said tools, a generally tubular and cylindrical retainer substantially closed at one end thereof and disposed with said closed end in covering relation to said one end of said elongated holding portion, said retainer having a longitudinally extending slot therein extending into said closed end of said retainer for allowing movement of said tools into said drive socket and having means for rotatable securement of said retainer on said holding portion and being selectively movable thereon to positions for retaining said tools in said storage recesses and to other positions for covering all of said recesses simultaneously for said

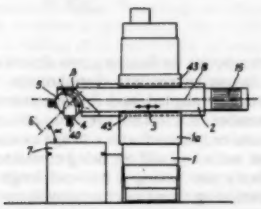
retaining said tools or for selective exposure of each of said recesses through said slot for selective release through said slot of said tools individually for permitting movement thereof between said tool storage recesses and said drive socket for use of said tools, and channel means defined between said elongated holding portion and said retainer for retained movement therein of said laterally extending retainer means of said tools during said movement thereof between said tool storage recesses and said drive socket for retention of said tools on said elongated holding portion for preventing loss of said tools from said holder during said release and movement thereof between said tool storage recesses and said drive socket, said tools being compositely constructed, each tool comprising a commercial standard tool bit having a drive shank at the end thereof opposite the working portion thereof, a tool adapter having a mating guide socket at one end thereof for reception of said drive shank of said standard tool bit and a larger drive shank including two generally parallel sides for engagement with said recesses for prevention of relative rotation therebetween about the longitudinal axes of said tools and for insertion of said tool into said drive socket of said elongated holding portion for use of said tool, and means for securing said shank of said tool bit into said mating guide socket of said tool adapter, said tool bits including commercial taps and said elongated holding portion having a portion having sockets for holding threading dies in fixed position for use.

4,478,540

SPINDLE HEAD ASSEMBLY WITH OBLIQUE AXIS OF ROTATION

Michel Sachot, Saclay, France, assignor to Centre D'Etudes Du Fraisage, Bagneux, France

Filed Jun. 16, 1982, Ser. No. 388,999
Claims priority, application France, Jun. 19, 1981, 81 12097
Int. Cl.³ B23C 1/12
U.S. Cl. 409—211 **15 Claims**



1. A machine tool for machining a workpiece disposed in a working plane comprising:

support means advanceable along an advance axis disposed in predetermined relation to said working plane;

a spindle head including a spindle rotatable about a spindle axis, said spindle head being rotatably mounted on said support about a head axis, said head axis being inclined with respect to said working plane at a first angle (α) in the range of 30° to 40°, said spindle axis forming an angle with respect to said head axis complementary to said first angle, the projection of said head axis and said support axis on said working plane forming an angle (α) of 45° therebetween;

means for automatically controlling rotation of said head; and

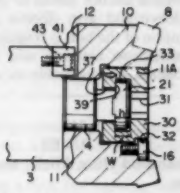
indexing means for locking said head in three predetermined positions substantially 120° apart, such that in one of said positions said spindle axis is perpendicular to said working plane and in at least another position it is parallel to said working plane.

4,478,541

TOOL MOUNTING

Misoru Okada, Yokosuka; Takeo Sone, Yokohama; Shigeru Sakamoto, Hachioji; Yuji Koizumi, Yokohama, and Iwao Tsuda, Tokyo, all of Japan, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Oct. 19, 1982, Ser. No. 435,289
Claims priority, application Japan, Oct. 20, 1981, 56-166425
Int. Cl.³ B23C 5/26
U.S. Cl. 409—232 **3 Claims**



1. An assembly comprising:

a cutting tool having a center aperture with internal threads,

a nut element having external threads rotatably connectible to said internal threads in the axial direction of said aperture,

said nut element including a rearwardly facing opening,

a holder having a forwardly extending stationary projection,

said projection and said opening together defining a bayonet coupling wherein said nut element is insertable rearwardly over said projection and is rotatable relative thereto to lock said nut element against forward axial removal from said projection,

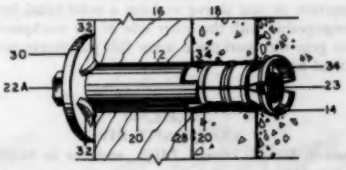
said nut element including means for receiving an implement for rotating said nut element about an axis of rotation in a direction relative to said tool such that said nut element tends to travel axially forwardly and said tool tends to travel axially rearwardly, said nut element abutting said stationary projection to be restrained against axially forward movement such that said tool travels axially rearwardly against said holder in response to rotation of said nut element in said direction.

4,478,542

EXPANSION ANCHOR GRIP SLEEVE ASSEMBLY

Russell Whelan, Jr., 5638 Miriam Rd., Philadelphia, Pa. 19124

Filed Feb. 28, 1983, Ser. No. 470,799
Int. Cl.³ F16B 13/06
U.S. Cl. 411—26 **5 Claims**



1. An expansion anchor grip sleeve assembly comprising an initially separable non-expandable grip sleeve in axial alignment with an initially separable expandable expansion anchor shield, said grip sleeve and anchor shield having aligned openings permitting the passage of a bolt, said bolt having a bolt head and a stem extending away from said bolt head, said bolt stem being positioned in said aligned openings, at least a portion of said stem being threaded to form a threaded stem which engages complimentary threads in the opening through said anchor shield, said grip sleeve having a flange having first and second faces with projecting fingers projecting away from said

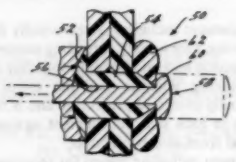
first face, said grip sleeve being positioned closer to said bolt head, and said anchor shield being positioned further away from said bolt head, said grip sleeve including locking means extending away from the first face of said flange in the same general direction of said fingers, with said bolt head being positioned against the second face of said flange, said locking means being adapted to be in actual contact with a portion of said expansion anchor, whereby when said assembly is located in a hole in a surface and said bolt is tightened by rotation thereof against said flange to urge said flange fingers against said surface such that said locking means actually contact a portion of said expansion anchor shield to prevent rotation of both said anchor sleeve and grip sleeeve in said hole, and whereby further rotation of the bolt is transferred solely to said expansion anchor shield to activate said expansion shield, thereby to firmly position said assembly in said hole.

4,478,543

BLIND RIVET

Lyman R. Lyon, Bloomfield Hills, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Jan. 25, 1982, Ser. No. 342,176
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—34 **7 Claims**



1. A blind rivet for installation in a workpiece having an aperture therein, said rivet comprising

an elongated mandrel having a radially enlarged anvil at one end and a gripping portion at the other end,

and a workpiece gripping sleeve disposed about said mandrel comprising a shear portion having a radially extending head at one end thereof for engagement with one side of a workpiece and a blind head forming portion of partially polymerized thermoset plastic between said shear portion and the anvil on said mandrel, the blind head forming portion of said shear sleeve being at a first temperature sufficiently low to preclude further polymerization thereof,

the head forming portion of said sleeve being axially and radially deformable upon heating thereof above said first temperature and upon axial movement of the anvil on said mandrel toward the head at the one end of the shear portion of said sleeve to form a solid blind head that is engageable with the other side of the workpiece thereby to grip the workpiece upon full polymerization of said blind head.

4,478,544

COMPOSITE RIVET

Norman S. Strand, Howell, Mich., assignor to Microdot Inc., Darien, Conn.

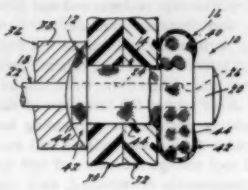
Filed Jun. 4, 1982, Ser. No. 384,873
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—34 **2 Claims**

1. A reinforced thermoset plastic rivet comprising:

a plurality of substantially parallel continuous longitudinally extending carbon fibres encapsulated in a B-stage thermoset resin matrix,

a plurality of longitudinally and circumferentially extending aromatic polyamid fibres enveloping said carbon fibres and encapsulated in a B-stage thermoset resin matrix,

at least one portion of said rivet being deformable to form a rivet head and fully polymerizable to the thermoset condition upon heating thereof, said polyamid fibres enveloping said



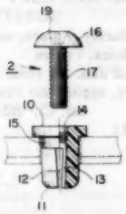
carbon fibres after formation of said rivet head to preclude splaying of said carbon fibres.

4,478,545

FASTENING DEVICE FOR PANELS OR THE LIKE

Akira Mizusawa, Fujisawa, and Yoshiaki Notoya, Zushi, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Division of Ser. No. 165,401, Jul. 2, 1980, Pat. No. 4,367,995.
This application Sep. 14, 1982, Ser. No. 418,167
Claims priority, application Japan, Jul. 6, 1979, 54-85043
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—57 **8 Claims**



1. A fastening device for fastening two objects together each respectively having an aperture therethrough, the apertures being concentrically aligned, said device comprising:

a female member of a flexible synthetic resin and having a body at one end thereof with a flange extending laterally therefrom and a leg, said leg being connected to one side of said body and having a free end longitudinally outwardly extending therefrom for being fitted into the apertures whereby said flange abuts one of the objects;

said female member having a bore therethrough longitudinally extending through said body and said leg;

said leg having at least one elongated groove through the peripheral wall thereof and longitudinally extending in the longitudinal direction of said leg and the peripheral wall of said bore in said body having at least one radially inwardly extending circumferentially continuous spiral ridge integral with and of the same material as said body and having portions in diametrically opposite surfaces of said bore, and the inner surface of said bore in said leg being entirely smooth, for, when a shank having a larger diameter than said bore is inserted therein, having said ridge flex in the longitudinal direction of said bore and having said leg free end radially expand thereby securing the shank within said bore;

a male member made of a synthetic resin and having a head and a shank, said shank being connected to a first side of said head and having a free end longitudinally outwardly extending therefrom for, when an axial force is exerted on said head, being axially thrust into said bore and radially expanding said leg free end and for having said head first

side abut said flange thereby fastening the two objects together between said flange one end and said leg free end; and

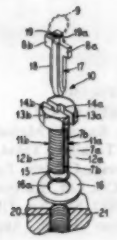
the circumferential surface of said shank having threads integral with and the same material as the shank for, when said shank is axially thrust into said bore, flexing in the longitudinal direction of said bore and, when said shank is secured within said bore and said head abuts said body and said flange, having said threads threadably engaging with said at least one ridge for, when said male member is rotated in one direction, threadably disengaging said male member from said female member thereby axially removing said shank from said bore.

4,478,546

QUICK INSERTION AND RELEASE BOLT SYSTEM

Mark J. Mercer, 5149 S. Kilbourn, Chicago, Ill. 60632

Filed Dec. 21, 1981, Ser. No. 332,618
Int. Cl.³ F16B *35/02*
U.S. Cl. 411—385 **2 Claims**



1. A quick insertion and release bolt system, comprising: first and second threaded bolt sections each comprising approximately half of a bolt and each having a head portion and threaded portion; each section having a flat face and a rounded threaded peripheral surface; a rectangular channel in each flat face running an entire length of each bolt section; a slide insert tapering to a leading point receivable between the flat faces when the bolt sections are assembled with the flat faces facing each other, said slide insert having a first pair of ribs and a second pair of ribs; the first pair of ribs being rectangular and laterally extending on opposite sides of the insert between the two flat faces and frictionally engaging substantially all portions of the faces of the threaded portions laterally of the rectangular channels when the bolt sections are held together; the slide insert having lateral extensions adjoining a termination of the first pair of ribs, said lateral extensions substantially completely filling an entire space between the head portions when the insert is fully inserted; the second pair of ribs being tapered at and extending from the leading point to a top of said lateral extensions and being rectangular and receivable in the rectangular channels; the first pair of ribs beginning and being tapered at a point rearwardly of the leading point to form a tri-point arrangement; flexible ring means for holding the two bolt sections in substantial alignment with one another with their flat faces abutting when the insert is not present between the faces; tab means extending at one end of the insert for pulling the insert away from between the two bolt sections when desired; the slide insert and each bolt section being shaped and dimensioned such that with the insert in place the peripheral rounded surfaces of the bolt sections lie on a common circle such that they both can be treaded into a threaded receiving aperture of corresponding dimension, and when the insert if removed the bolt sections with flat faces abutting freely slide into or out of the aperture without substantial threaded engagement; the arc of each of said rounded peripheral surfaces being less than 180°; and a bevelled surface being provided between the flat surface and edges of the rounded peripheral surface on each bolts section.

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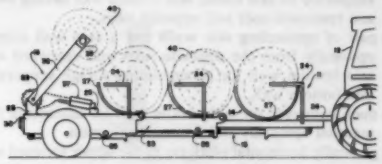
BALE HANDLING APPARATUS

Leland A. Der Boer, P.O. Box 364, Lincoln, Mont. 59639

Filed Sep. 29, 1982, Ser. No. 428,198
Int. Cl.³ A01D *87/12*; B60P *1/48*
U.S. Cl. 414—24.5 **13 Claims**



1. Bale handling apparatus including a base portion, a bale supporting portion, a bale moving portion and a control portion; said base portion including a frame section, said frame section including a first bed section, wheeled carriage means supporting said first bed section, a second bed section, said second bed section being telescopable with respect to said first bed section, said base portion further including a hitch member disposed at the end of said frame section remote from said carriage means; said bale supporting portion including support means extending upwardly from each of said bed sections, the support means of the respective bed sections being arranged to be aligned with one another when said bed sections are telescoped together; said bale moving portion including a support section, said support section extending upwardly from said first bed section adjacent the end thereof remote from said second bed section, a shaft member rotatably carried by said support section, said shaft member being oriented transversely of said first bed section, arm members pivotally connected adjacent the ends of said shaft member, grabber means mounted on said arm members, said grabber means extending toward each other; said control portion including means for cooperatively pivoting said arm members with respect to said shaft member, means for rotating said shaft member, and means for telescoping said second bed section with respect to said first bed section; whereby a plurality of individual bales can be loaded sequentially onto said bed sections of said apparatus, transported to a different location and thereafter unloaded in reverse order for storage or feeding.

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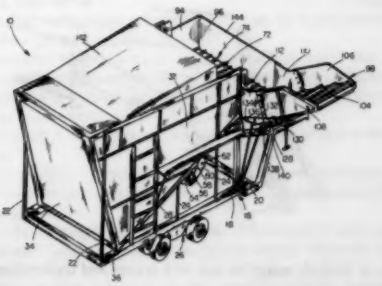
FORAGE ACCUMULATOR BOX

Daniel A. Heimes, R.R. 3, Box 63G, Hartington, Nebr. 68739

Filed Aug. 17, 1981, Ser. No. 293,318
Int. Cl.³ B60P *1/38*
U.S. Cl. 414—502 **6 Claims**



1. A forage accumulator box, comprising,

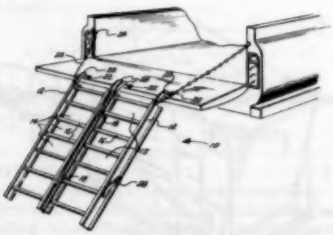
an elongated frame having forward and rearward ends and opposite sides,
a tongue structure extended forwardly from said frame for connection to a towing vegicle,
ground wheel means on said frame for rolling movement in forward and rearward directions,
an elongated upwardly and forwardly inclined bottom wall supported on said frame, said bottom wall having forward and rearward ends and opposite sides,
a pair of upstanding side walls and a rear wall extending upwardly from the opposite sides and rearward end of said bottom wall for accumulating forage supported on said bottom wall,
a main conveyor on said bottom wall for advancing forage material upwardly and forwardly thereon,
a generally horizontal platform at the upper forward end of said bottom wall for receiving material conveyed thereto by said main conveyor, said platform having opposite transversely facing starting and discharge ends,
a cross conveyor on said platform for moving material in a direction transversely of said box toward said discharge end, and
a discharge chute operatively connected to the discharge end of said platform for pivotal movement about a longitudinal axis for discharging material conveyed thereto by said cross conveyor, said discharge chute being movable between a working position extended transversely upwardly and outwardly from said platform and a transport position having a reduced outward extent from said platform whereby the width of said box is reduced upon movement of said discharge chute to the transport position,
a forward wall and side wall extending upwardly from the forward side and starting end of said platform for containing forage material on said platform,
said discharge chute comprising a stationary discharge platform having a discharge conveyor thereon and forward and rearward wall members,
said bottom wall and platform being situated within the transverse extent of said ground wheel means,
said forward wall having a top edge situated substantially below the top edges of said upstanding side walls whereby forage material may be directed rearwardly over said forward wall and between said upstanding side walls.

4,478,549

FOLDABLE LOADING RAMP FOR ALL TERRAIN/RECREATIONAL VEHICLES AND THE LIKE

Curtis Stelly, and Elmer J. Arnaud, both of Rte. 1-A, Box Oak 1, Fordoche, La. 70732

Filed May 20, 1983, Ser. No. 496,574
Int. Cl.³ B65G *67/02*
U.S. Cl. 414—537 **10 Claims**



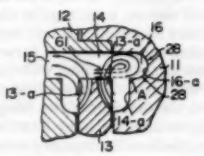
1. A foldable ramp for use with trucks and trailers comprising:
a. left and right generally rectangular ramp panel sections, each providing respectively cooperating, mating edge portions which can join along a longitudinal axis, and transverse top and bottom edges;
b. left and right tailgate anchor means provided on each ramp section for removably engaging each ramp section top edge to a truck or trailer; and
c. a hinge assembly that defines the ramp center during use and connects the left and right ramp sections together at the mating edges so that they can fold upon each other to reduce the ramp width for storage;
d. cable means attached to each ramp section for forming a tension carrying removable connection extending between each ramp section and the truck or trailer to prevent accidental disconnection of either ramp section from the truck or trailer during use, said means carrying tensile load to prevent movement of the ramp away from the truck or trailer when a load moving into the truck or trailer engages the ramp.

4,478,550

PUMP APPARATUS

Kiyohiko Watanabe, Chiryu; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Toshihiro Takei, Kariya; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 21, 1982, Ser. No. 370,350
Claims priority, application Japan, Apr. 22, 1981, 56-58105[U]
Int. Cl.³ F04D *5/00*
U.S. Cl. 415—53 T **2 Claims**



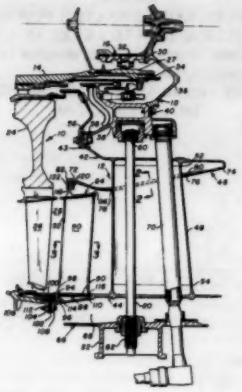
1. A pump apparatus comprising:
a regenerative pump means;
said regenerative pump means including a pump housing and a closed vane type impeller rotatably housed in said pump housing,
said impeller being substantially disc-like shaped and provided with a plurality of radial vane grooves formed in portions of opposite end faces of said impeller adjacent to the outer peripheral surface thereof and spaced in the circumferential direction relative to each other,
said pump housing cooperating with said impeller to define a substantial annular fluid passage surrounding said radial vane grooves,
said pump housing being provided therein with suction and discharge ports,
said discharge port being communicated with said annular fluid passage through a portion of one side surface thereof, and
a recess provided in a portion of the other side surface of said annular fluid passage opposing to said discharge port, said recess being so disposed that a radial innermost side wall portion thereof is located radially outward of said outer peripheral surface of said impeller.

4,478,551

TURBINE EXHAUST CASE DESIGN

Fred L. Honeycutt, Jr., Lake Park, and Erik A. Lindstrom, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1981, Ser. No. 328,565
Int. Cl.³ F01D 9/02
U.S. Cl. 415—142 5 Claims



1. In an axial flow gas turbine engine including a turbine section comprising at least one turbine rotor stage, a turbine exhaust case assembly disposed downstream from said rotor stage and including means defining an axially extending annular gas flow path, the exhaust case assembly comprising:

inner case means;

outer case means spaced radially outwardly from said inner case means;

a stage of turbine exit guide vanes disposed in said gas flow path for straightening the flow of gases exiting said turbine rotor stage, said guide vanes having radially outer ends attached to said outer case means in a manner permitting rocking of said vanes in an upstream and downstream direction about the point at which they are attached to said outer case means;

a plurality of circumferentially disposed struts extending radially across the flow path downstream of said guide vanes and having inner ends fixedly attached to said inner case means and outer ends fixedly attached to said outer case means; and

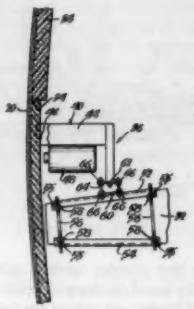
fairing means having an upstream end and downstream end, said fairing means including sheet metal wall means having an upstream end, said wall means being disposed between said inner case means and outer case means defining the radially inner surface of said annular gas flow path immediately downstream of said exit guide vanes, said fairing means being cantilever supported from its downstream end from said inner case means downstream of said struts, each of said struts passing through an opening in said wall means, said upstream end of said fairing means engaging said inner ends of said exit guide vanes to provide axial support for said guide vanes, said fairing means comprising a support ring integral with said upstream end of said sheet metal wall means, said support ring providing stiffness to said wall means and having an annular outwardly facing channel disposed therein, said inner ends of said exit guide vanes including tangs extending radially inwardly into said channel, the width of said channel in the axial direction being wider than the thickness of said tangs in the axial direction, permitting axial movement of the inner ends of said vanes, said inner ends of said exit guide vanes being free to move radially relative to said fairing means.

4,478,552

METHOD AND APPARATUS FOR FAN BLADE TIP CLEARANCE

Stanley E. Thompson, 15710 Old Redwood Hwy., Healdsburg, Calif. 95448

Filed Nov. 8, 1982, Ser. No. 439,914
Int. Cl.³ F03D 11/00
U.S. Cl. 415—174 6 Claims



1. A method of adjusting the amount of clearance between the tips of the fan blades of a large axial flow fan and the fan cylinder, comprising the steps of:

(a) glueing a plurality of spacer panels of a foam material construction to the inside surface of the fan cylinder in facing relationship to the tips of the fan blades;

(b) securing a vertically extending cutting means adjacent the tip of at least one of the fan blades, said cutting means having a vertically extending cutting blade which extends outward from the tip of the fan blade by a prselected distance;

(c) rotating the fan blade so as to cause the cutting blade to trim the spacer panels in a sequential manner around the circumference of the fan cylinder and thereby

(d) securing a plastic sheet in covering relationship to the trimmed surface of each of the spacer panels by fastening means extending through the plastic sheet, spacer panel and fan cylinder; and

(e) applying a sealant material over the top surface of each of the spacer panels.

4,478,553

ISOTHERMAL COMPRESSION

Herman M. Leibowitz, Schenectady, and Somayajulu D. S. R. Karamchetty, Latham, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,156
Int. Cl.³ F01D 5/08; F02B 47/02
U.S. Cl. 416—97 R 8 Claims

1. A high efficiency compressor for use in a compression intensified gas process that includes:

an impeller having a series of radially extending blades affixed thereto that coact to form flow passages therebetween through which a process gas is conducted during the compression process;

each blade having a front face and a back face and a blade tip;

a driveshaft for rotating the impeller at a speed sufficient to compress the process gas conducted through said flow passages;

each flow passage having a suction side and a pressure side;

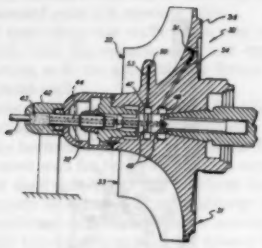
a coolant supply channel that passes axially through said shaft;

a first coolant metering circuit passing radially outward through each of said impeller blades such that said first circuit communicates at said blade radially inner end with

said supply channel and at said blade radially outer end with a first nozzle for introducing a coolant into one of said flow passages;

each of said first nozzles positioned in said back face of said associated blade to discharge coolant into said suction side of an adjacent passages so as to transverse said flow passage, said first nozzles further sized and positioned to substantially avoid discharged liquid coolant from impinging on said blades and to cool the process gas in said flow passages; and

a coolant supply means for introducing a liquid coolant into the said supply channel whereby coolant is metered through the said first circuit as said impeller rotates.

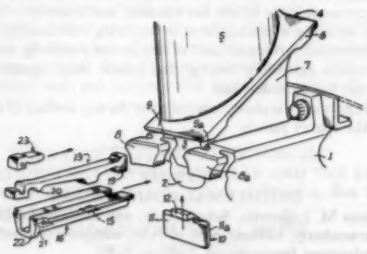


4,478,554

FAN BLADE AXIAL AND RADIAL RETENTION DEVICE

Jean M. Surdi, Melun, France, assignor to S.N.E.C.M.A., Evry, France

Filed Oct. 18, 1983, Ser. No. 542,972
Claims priority, application France, Nov. 8, 1982, 82 18653
Int. Cl.³ F01D *5/32*
U.S. Cl. 416—221 **7 Claims**



1. In a retention device for use in securing a fan blade axially and radially, the blade having a platform and a root of reentrant form and thus being capable only of axial sliding into a corresponding groove in the rim of a fan rotor disc,

means defining axially-extending teeth adjacent the periphery of the rim of the disc and adjacent pairs of said teeth having opposed radial recesses

locking means of each blade being engaged in said two adjacent opposed recesses and serving to lock the blade axially,

a resilient wedge interposed between the root of the blade and the bottom of the groove in order to exert on the blade root a force directed radially outwardly, and

a holding key pre-stressing the wedge and interposed between the wedge and the internal downstream face of the root of the blade,

the improvement comprising,

a trough-shaped member interposed between the resilient wedge and the flanks and bottom of said groove, the trough-shaped member extending axially of the fan, and having an opening intermediate its ends, and

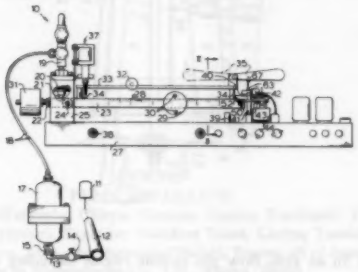
means defining an abutment on the wedge which engages in the opening of the trough-shaped member and seats on the bottom of the groove.

4,478,555

BACK PRESSURE COMPENSATOR FOR APPARATUS FOR CONTROLLING LIQUID LEVEL IN A RESERVOIR

William S. Pearson, Hampstead, Md., assignor to Cyrpo, Incorporated, Hampstead, Md.

Filed Aug. 18, 1982, Ser. No. 409,323
Int. Cl.³ F04B *41/06*
U.S. Cl. 417—7 **13 Claims**



1. In apparatus having means responsive to head pressure in a main communicating with a reservoir which is intermittently supplied by pump means having electrical control switch means, for automatically controlling predetermined liquid level in the reservoir by operation of switch tripping means to activate said switch means for pump means cut-in upon drop in said liquid level and for pump means cut-out at said predetermined liquid level, the improvement comprising:

means mounted separate from said switch tripping means, and having a device operable for selectively restraining said switch tripping means for delaying said pump means cut-out to compensate for abnormal back pressure in said main tending to cause premature pump means cut-out operation of said tripping means at less than said liquid level, and also operable for selectively increasing the differential between pump means cut-in and pump means cut-out, without changing pump means cut-in by operation of said switch tripping means.

4,478,556

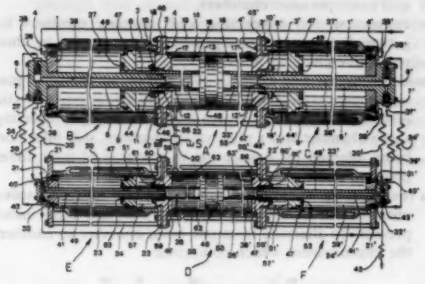
THREE OR FOUR STAGE GAS COMPRESSOR

Antonio Gozzi, 14, Via Giordano, 41050 Montale Rangone, Modena, Italy

Filed Apr. 21, 1982, Ser. No. 370,385
Claims priority, application Italy, Apr. 21, 1981, 40044 A/81; Apr. 21, 1981, 40045 A/81
Int. Cl.³ F04B *3/00*
U.S. Cl. 417—256 **4 Claims**

1. A multistage reciprocating gas compressor with at least three compression stages, comprising: a first and a second compression unit each consisting of three longitudinally aligned cylinder sections; a central hydraulic section comprised of a central cylinder closed at each end and divided into two opposed hydraulic chambers by a central hydraulically operated piston; a lateral gas compression section aligned on each end of the central section, each gas compression section comprised of a cylinder closed at a first end by a respective end of the central section and closed at a second end, and provided with a primary compression piston connected to and driven by said hydraulically operated piston and defining a primary

compression stage; the first compression unit having a central bored out rod extending from said second end of each lateral compression section and telescoping in a movable hollow cylinder connecting each primary compression piston with the hydraulic piston whereby the hollow cylinder and bored out



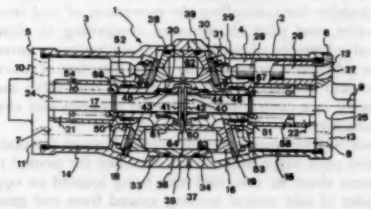
rod constitutes a compression section of a secondary compression stage; the primary and secondary compression stage of the first compression unit constituting the first and third compression stage of the gas respectively, and the primary compression stage of the second compression unit constituting the second compression stage of the gas.

4,478,557

HYDRAULIC POWER TRANSDUCER

Marcel Schott, Fontenay Le Fleury, France, assignor to Messier-Hispano-Bugatti(s.a.), Montrouge, France

Filed Feb. 28, 1983, Ser. No. 470,669
Claims priority, application France, Mar. 5, 1982, 82 03670
Int. Cl.³ F04B *35/00*
U.S. Cl. 417—271 **5 Claims**



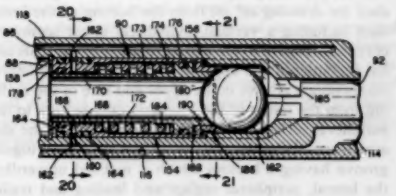
1. A hydraulic power transducer comprising: a body having two ends delimiting an elongate oblong cavity, said body ends delimiting two plane surfaces which are parallel to each other and which are situated about the same axis, said two surfaces constituting first and second slide faces, each body end having inlet and outlet openings therethrough; first and second barrels of cylinders disposed inside said cavity, each barrel being mounted to rotate about said axis and each barrel being in sliding contact with a respective one of said slide faces; a shaft disposed substantially along said axis coupling said barrels of cylinders to rotate said barrels together; each barrel comprising a plurality of hollow cylinders, each cylinder having an opening in one face of its barrel which slides over the corresponding slide face, said openings being so disposed that they pass over said inlet and outlet openings during the course of barrel rotation, and each cylinder having a corresponding piston mounted therein to slide in sealed manner, said pistons forming a set, said set of said pistons being connected to a shoe, said shoe being slidably mounted on a reference surface which is inclined relative to said axis such that, when said barrels of cylinders rotate, firstly the pistons are moved away from the openings in the cylinders in which they slide when said openings pass over an inlet opening, and secondly the pistons are moved towards the openings in the cylinders in which they slide when said openings pass over an outlet opening; a wedge disposed between said two barrels having two opposed faces constituting bearing surfaces for said shoes, said wedge having an axial bore and being disposed in said cavity such that it surrounds said shaft; and sealing means for both said shaft and said wedge; and wherein said sealing means comprises a collar made fast to said shaft, sealing members for pressing against the side faces of said collar, and means for applying pressure to said sealing members to keep them pressed against the collar.

4,478,558

DOWNHOLE PUMP WITH CHECK VALVE

Douglas B. Owen, Rochester, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Division of Ser. No. 175,281, Aug. 4, 1980, Pat. No. 4,360,320.
This application Jun. 25, 1982, Ser. No. 392,078
Int. Cl.³ F04B *49/08*; F16K *31/12*
U.S. Cl. 417—296 **5 Claims**



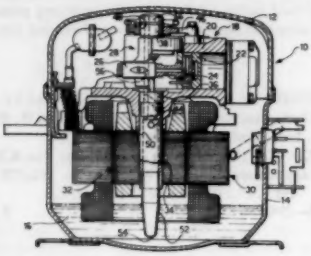
1. A downhole pump for pumping oil out of an oil well, said pump comprising a plurality of pump modules, a plurality of transfer modules between said pump modules, means for supplying fluid under operating pressure to oil in said pump modules for urging the oil upwardly; a check valve in each of said pump modules and said transfer modules, each of said check valves having a valve seat and a valve ball with said valve ball normally seating against said seat to prevent the flow of oil downwardly, each of said check valves having piston means for separating said valve ball and said valve seat when fluid under high pressure above operating pressure is applied to said check valve, to enable the oil to drain downwardly through said pump and said transfer modules, and means for applying fluid under operating pressure to said piston means to urge said piston means toward said valve ball.

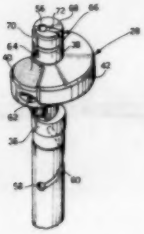
4,478,559

COMPRESSOR WITH DUCTED CRANKSHAFT HAVING A GROOVED END FOR OIL DISTRIBUTION

Norbert Andrione, and Fulvio Bandoli, both of Turin, Italy, assignors to Aspera S.p.A., Italy

Filed Jul. 9, 1981, Ser. No. 281,617
Claims priority, application Italy, Jul. 18, 1980, 68152 A/80
Int. Cl.³ F04B *17/00, 39/02*
U.S. Cl. 417—368 **7 Claims**





1. In a hermetic compressor for refrigerant fluids of the type having a hermetic housing enclosing a reciprocating motor-compressor unit with a vertical crankshaft having an upper end surface, a lateral, peripheral surface, and a longitudinal internal duct for drawing off oil from the bottom of the housing, the duct including a vertical, cylindrical upper section which is eccentric relative to the axis of rotation of the shaft and which has its outlet at the upper end of the shaft, the improvement comprising a groove in the upper end face of the shaft extending from the outlet of the eccentric duct section to the lateral peripheral surface of the upper end portion of the shaft in an area where the outlet and the surface are closest together, said groove having a bottom which is inclined upwardly toward the lateral, peripheral surface and leading and trailing sides relative to the direction of rotation of the shaft wherein said trailing side of said groove is substantially tangential to the outlet of said duct and intersects a common diametral plane which includes the axis of rotation of the shaft and the axis of the eccentric duct section at the lateral peripheral surface of the upper end portion of the shaft at an acute angle which is pointed in the direction of rotation.

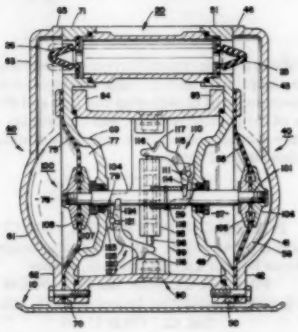
4,478,560

FLUID-OPERATED RECIPROCATING PUMP

Warren E. Rupp, Mansfield, Ohio, assignor to The Warren Rupp Company, Mansfield, Ohio

Filed Sep. 23, 1982, Ser. No. 422,094
Int. Cl.³ F04B *43/06*
U.S. Cl. 417—393 **3 Claims**

1. In a fluid-operated pump including:
a central housing;
a pair of chamber housings disposed at opposite ends of said central housing;
a pair of pumping members, one in each of said chamber housings and dividing the interior of said chamber housings into inner and outer pressure chambers;
inlet and discharge means disposed to communicate with said outer pressure chambers;
a connecting rod connecting said pumping members together for common reciprocatory movement in their respective chamber housings;
said central housing defining inlet and outlet ports and passage means connecting said inlet and outlet ports to said inner chambers, said passage means including a reversing valve chamber and a pilot valve chamber, said inlet port being adapted for connection to a source of fluid under pressure and
a reversing valve movably mounted in said reversing valve chamber for controlling the supply of said fluid under pressure to alternate from one inner chamber to another; the improvement which comprises:



pilot valve means movably mounted in said pilot valve chamber for controlling the movement of said reversing valve, said pilot valve means comprising an elongated valve member adapted for reciprocating linear movement in a direction perpendicular to the direction of movement of said connecting rod, the axis of said valve member being in a central plane centered between said chamber housings;
a pair of lever means in said central housing for operating said pilot valve means, each mounted for pivotal movement about an axis, said axes being located on opposite sides of said central housing spaced from and generally perpendicular to said connecting rod and to said pilot valve member, and
means on said connecting rod for alternately engaging and pivoting said lever means about their respective axes,
each lever means having an arm engageable with an end of said valve member for shifting said valve member from one position to another in response to reciprocating movement of said connecting rod.

4,478,561

HYDRAULIC INTENSIFIER

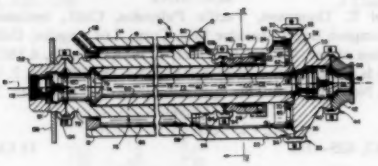
Thomas L. Elliston, Fort Worth, Tex., assignor to Hydra-Rig, Incorporated, Fort Worth, Tex.

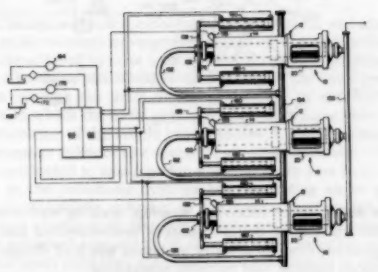
Filed Mar. 25, 1982, Ser. No. 361,602
Int. Cl.³ F04B *19/02*
U.S. Cl. 417—400 **18 Claims**

1. A multiple hydraulic intensifier unit for pumping working fluid at a delivery pressure which is a multiple of the working pressure of a power fluid for operating said intensifier unit, said intensifier comprising:
a plurality of hydraulic intensifiers each comprising an elon-

gated stationary power cylinder member having a first head portion at one end and supporting a working fluid plunger, and a second head portion at the opposite end of said power fluid cylinder member;

a reciprocable working fluid cylinder member disposed within said power fluid cylinder member and extending through said second head portion, said working fluid cylinder member including a piston connected thereto, said piston and said second head portion defining with said power fluid cylinder member a power fluid cylinder chamber, said piston being responsive to the introduction of power fluid to said power fluid cylinder chamber to stroke said working fluid cylinder member with respect to said plunger to deliver working fluid from a working fluid chamber formed by said working fluid cylinder member and said plunger;





a working fluid discharge manifold connected to each of said intensifiers for receiving working fluid discharged therefrom;

a working fluid inlet manifold disposed between said first head portions and an end of said working fluid cylinder members extending from said second head portions and at an end of said intensifiers, respectively, opposite said first head portions;

flexible conduit means connected to each of said working fluid cylinder members at said end extending from said second head portions and to said inlet manifold, respectively, for delivering working fluid to each said working fluid chamber;

a source of power fluid; and

means for delivering power fluid to each of said intensifiers for stroking said working fluid cylinders to deliver working fluid to said working fluid discharge manifold.

4,478,562

OIL LUBRICATION OF VACUUM PUMP WITH PULSATING OIL FEED

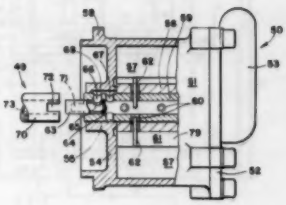
Heinz Schippers, Remscheid, and Siegfried Hertell, Radevormwald, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Continuation of Ser. No. 115,206, Jan. 25, 1980, abandoned. This application Sep. 21, 1982, Ser. No. 420,802

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1979, 2857494; Dec. 24, 1979, 2952401

Int. Cl.³ F04C *18/00, 23/00, 29/02*

U.S. Cl. 418—88 **14 Claims**



1. In a rotary vane vacuum pump having vanes movable in slits of the pump rotor, a rotatable hollow tubular drive shaft for the pump rotor which is operated by rotational drive means, and an oil feed line in fluid connection with the vacuum pump through said hollow tubular drive shaft to provide a stream of lubricating oil thereto under excess pressure from an oil pump, said hollow tubular drive shaft containing radial openings within the rotor for the outward supply of lubricating oil to said slits and to the pump elements being lubricated, the improvement which comprises:

a journal section of said hollow drive shaft which is rotatably supported in a bearing eye of the pump housing at one end of the rotor;

at least one set of paired radial channel segments arranged in said journal section at positions axially spaced from each other within said bearing eye;

partition means in said journal section of the hollow shaft to seal off its hollow interior at a position located axially between the paired radial channel segments;

at least one fixed oil-conducting channel segment arranged within the beaing eye to bridge the axial distance between said paired radial channel segments such that, upon rotation of the hollow drive shaft by said drive means, said fixed and said paired radial channel segments are alternately connected and disconnected to produce an intermittent pulsating flow stream.

4,478,563

APPARATUS FOR UPWARDLY EXTRUDING AND COOLING A THERMOPLASTIC RESIN MULTIPLE TUBE STRUCTURE

Robert E. Lhommeau, Savigny Sur Orge, and Ducruy Guy R., Varces, both of France, assignors to Indumat S.A., Wissous, France

Filed Oct. 27, 1981, Ser. No. 315,281

Claims priority, application France, Oct. 30, 1980, 80 23188

Int. Cl.³ B29C *25/00;* **B29D** *23/04;* **B29F** *3/04, 3/08*

U.S. Cl. 425—71 **8 Claims**

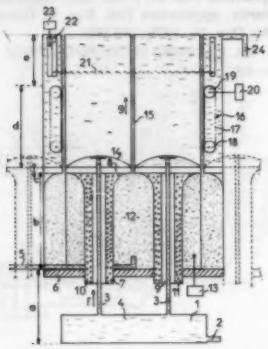
1. Device for upwardly extruding a multiple tube structure from a thermoplastic material comprising:

an extrusion die comprised of a plurality of regularly spaced cylinders having upper ends defining extrusion orifices therebetween, means mounting said cylinders in upright regularly spaced relation to each other so that there are spaces between adjacent cylinders, each cylinder having a lower portion of smaller diamter than the upper end,

heating means associated with the lower portion of each cylinder, said upper ends being of a greater dimension than the lower portion and of a heat insulating material;

supply means for injecting fluid thermo-plastic material to a bottom region of each space between the adjacent cylinders;

a liquid cooling bath above and in direct contact with the upper ends of the cylinders;



a cooling liquid passage extending through each cylinder in thermally insulated relation to the cylinder;

means for supplying liquid to said cooling bath through said passages extending through each cylinder, traction means in said cooling bath for pulling extruded multiple tube structure solidified by said bath upwardly through the bath, and cutting means in said liquid cooling bath for cutting the solidified multiple tube structure.

4,478,564

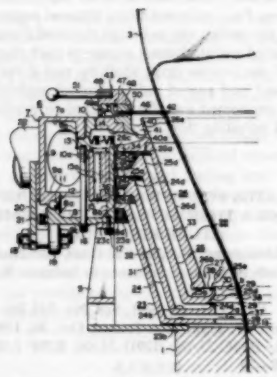
AIR RING FOR INFLATION FILM MOLDING

Jitsumi Shinmoto, Tokyo, Japan, assignor to Tomi Machinery Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,941

Int. Cl.³ B29C *1/00*; B29F *3/08*

U.S. Cl. 425—72 R **10 Claims**



1. An air ring for inflation film molding in which cooling action is obtained by blowing cooling air out from a horizontal annular slit after the film is extrusion molded by a die, comprising:

an air ring main body consisting of a hollow annular body and communicating with an air supply tube;

a slit defining annular body which is disposed substantially coaxially with and within the air ring main body for defining a primary air outlet having the horizontal annular slit for cooling the molded film by blowing cooling air thereto; and

a channel communicating the air ring main body with the primary air outlet and with another air slit defining body, the channel being branched out in the latter slit defining body into a plurality of slits for blowing the cooling air onto the extrusion molded film from more than one direction, said slit defining annular body being comprised of at lease two substantially concentric frusto-conical hollow bodies which are adjustably threaded into a sleeve member at their upper broader ends so that an opening gap defined by the lower free ends of the frusto-conical hollow bodies can be adjusted by changing the relative axial positions of the hollow bodies.

4,478,565

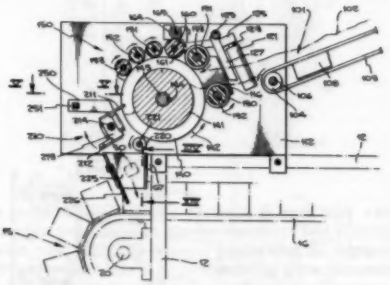
COMPACT DOUGH DIVIDING AND FORMING MACHINE

Daniel T. Thompson, Pacific Palisades, Calif., assignor to Thompson Bagel Machine Mfg. Corp., Los Angeles, Calif.

Division of Ser. No. 307,508, Oct. 1, 1981, Pat. No. 4,368,019, which is a continuation-in-part of Ser. No. 183,187, Sep. 2, 1980, Pat. No. 4,336,010. This application Nov. 24, 1982, Ser. No. 444,347

Int. Cl.³ A21C *5/00*, *11/10*

U.S. Cl. 425—141 **14 Claims**



1. A dough batch receiving, shaping, dividing and forming machine for making dough bodies of predetermined size and configuration from an initially unshaped batch of dough in a continuous manner, said machine comprising:

an infeed conveyor for receiving a batch of unshaped dough and conveying it to a preshaping location;

a pair of laterally spaced dough batch width preshaping means at said preshaping location for preshaping said batch into a uniform width;

a pair of top and bottom preshaping and dough advancing means for preshaping said batch into a uniform height and advancing said batch from between said width shaping means to a divider location;

dough divider means at said divider location for receiving said dough batch in a preshaped configuration, shaping it to a pair of generally retangular cross section strips of dough and advancing the strips to a cut-off location;

dough cut-off means at said cut-off location for dividing said strips into generaly rectangular cross section parts of determinable length, separating such parts in sequence from said strips and delivering them individually to a forming location;

dought forming means at said forming location for receiving individual dough parts of generally rectangular cross section and forming them into a desired configuration; and

variable drive means for operating said infeed conveyor and

said top and bottom preshaping and dough advancing means at selectably varying speeds of dough batch advancements wherein said variable drive means includes:

dough batch engaging and height sensor means for sensing the height of the said dough batch on said divider means as it is being shaped into said pair of strips on said divider means; and

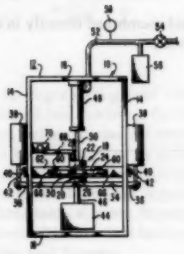
means for operating said variable drive means to speed up or slow down the advancement of said dough batch infeed by said conveyor means and dough advancing means in response to the height of said dough batch on said divider means sensed by said sensor means.

4,478,566

APPARATUS FOR INJECTION MOLDING AN ARTICLE

John J. Prusak, and Bhupendra P. Patel, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 350,087, Feb. 18, 1982, Pat. No. 4,414,167.
This application May 27, 1983, Ser. No. 498,764
Int. Cl.³ B29F 1/06
U.S. Cl. 425—149 **2 Claims**



1. In an apparatus for molding an article which includes a pair of mold members having recesses in their opposed surfaces which are adapted to mate to form a mold cavity, a pneumatic cylinder having a piston rod secured to one of the mold members for moving the mold members together to a collapsed position in which the mold cavity is of a volume less than the desired volume of the article being molded, a pipe connecting the pneumatic cylinder to a source of air under pressure, valve means connected to said pipe for allowing air to pass from the source to the pneumatic cylinder but preventing air to pass from the pneumatic cylinder to the source, and means for injecting a plastic mold material into the mold cavity when it is in its collapsed position to fill the cavity and force the mold members apart until they are in an expanded position in which the mold cavity is of the desired volume of the article, the improvement comprising

an enclosed air reservoir connected to the pipe between the pneumatic cylinder and the valve means into which the air from the cylinder flows when the mold material moves the mold members to their expanded position for maintaining a substantially uniform pressure on the plastic mold material in the mold cavity when the material is moving the mold members from their collapsed position to their expanded position.

4,478,567

FRONT LOADING CENTRIFUGAL SPIN CASTER

Leonard S. Schaer, Greenwich, Conn., assignor to Tekcast Associates, Inc., New Rochelle, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,895
Int. Cl.³ B29C 5/04
U.S. Cl. 425—150 **7 Claims**

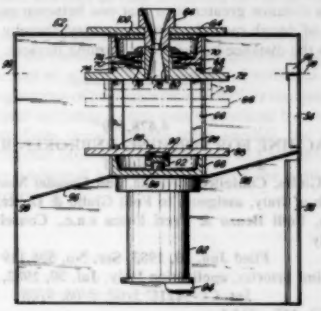
1. A spin casting machine for spinning a mold, comprising:

a spin caster housing;

a vertically stationary top plate disposed within the housing and adapted to rotate about a substantially vertical axis, said top plate having an aperture at the center thereof through which a liquid material is adapted to pass to said mold;

a vertically movable bottom plate disposed within the housing and adapted to rotate about said substantially vertical axis;

a loading door disposed on a side of the housing and adapted



to allow said mold to be moved therethrough in a generally horizontal direction and placed on the bottom plate;

means for moving said bottom plate vertically upward to cause the mold to contact the top plate; and

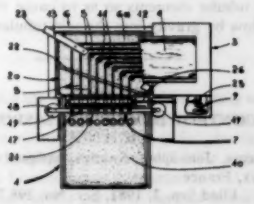
means for applying a rotational force to said top plate, said rotational force propagating from said top plate through said mold to said bottom plate, the top plate, bottom plate and mold thus rotating together.

4,478,568

MACHINE FOR FORMING UNBROKEN RINGS, OR SIMILAR, OF DOUGH OUT OF STRIPS OF MOISTENED AND KNEADED FLOUR

Giulio Folli, Conselice-Ravenna, and Marino Casadei, Cesena, both of Italy, assignors to Folli Giulio & Dante, di Folli Giulio, Folli Renzo & Preti Fosca s.n.c., Conselice-Ravenna, Italy

Filed Jun. 20, 1983, Ser. No. 506,120
Claims priority, application Italy, Jul. 30, 1982, 3503 A/82
Int. Cl.³ A21C 3/02, 3/08
U.S. Cl. 425—320 **13 Claims**



1. Machine for forming enclosed shapes, such as rings, of dough out of strips of moistened and kneaded flour, comprising: devices for manipulating the moistened and kneaded flour and for creating from this, a plurality of continuous side by side strips of dough, devices for forming individual enclosed shapes out of said strips of dough, drive and guide elements for channelling said strips of dough from said manipulation devices to said forming devices, and means for powering and controlling all of said devices and said drive and guide elements, wherein the structure of said drive and guide elements is such as to

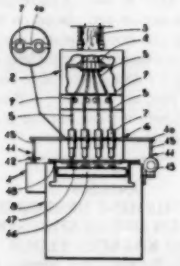
constantly keep said strips of dough virtually parallel with one another and to give each of said strips a flow trajectory defined by a succession of essentially rectilinear sections, angularly deviated, by a plurality of deflection means, placed side by side, along at least one deviation line inclined with respect to the flow trajectory, the strips being forwarded downwards the deviation line, inclined with respect to the flow trajectory, in such a way as to define between each couple of strips therebelow, a distance greater than that one between each couple of strips of dough over the flow trajectory, thereby corresponding to the distance between the forming devices.

4,478,569

MACHINE FOR FORMING UNBROKEN RINGS OF DOUGH

Folli Giulio, Conselice-Ravenna, and Casadei Marino, Cesena, both of Italy, assignors to Folli Giulio & Dante, di Folli Giulio, Folli Benzo & Preti Fosca s.n.c., Conselice-Ravenna, Italy

Filed Jun. 20, 1983, Ser. No. 506,119
Claims priority, application Italy, Jul. 30, 1982, 5013/82[U]
Int. Cl.³ A21C *3/02, 3/08, 9/08*
U.S. Cl. 425—324.1 **6 Claims**



1. Structure of a machine for forming unbroken rings of dough from strips of dough which is delivered by manipulation devices, comprising thinning rollers for thinning and separating the dough into strips, shaped pieces of dough being produced by means of forming devices comprising tubular elements that are fed with said strips, means for supporting and oscillating said forming devices above a terminal conveyor, and wherein the said thinning rollers are positioned directly above said tubular elements so as to cause the said strips of dough to flow by gravity into the said tubular elements.

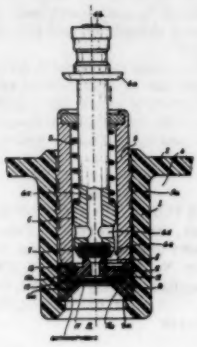
4,478,570

FLOW CONTROL DEVICE FOR DISPOSABLE GAS LIGHTER

Stig Johansson, Jönköping, Sweden, assignor to Feudor S.A., Venissieux, France

Filed Sep. 2, 1981, Ser. No. 298,725
Claims priority, application France, Sep. 5, 1980, 80 19585
Int. Cl.³ F23D *13/04*
U.S. Cl. 431—344 **7 Claims**

1. In a wickless disposable lighter having a lighter body forming a reservoir for a liquid hydrocarbon fuel and a valve system mounted in said body, the combination wherein said valve system comprises a valve for selectively releasing a stream of fuel from said body, a support disposed upstream of said valve and between said valve and said reservoir, and a maximum-flame-height-reducing valve member mounted in said support and disposed between said valve and said reservoir, said member comprising a mesoporous membrane having a high wettability with respect to the hydrocarbon fuel and pores of a radius ranging from 20 to 500 Ångstrom units with



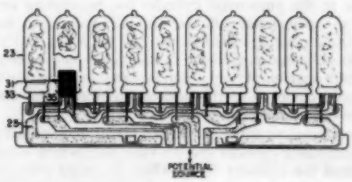
an upstream side of said membrane directly in communication with said liquid reservoir.

4,478,571

PHOTOFLASH ARRAY HUMIDITY PROTECTED SWITCHES

Carl F. Kackenmeister, Williamsport, and Gary L. Houseknecht, Hughesville, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 27, 1982, Ser. No. 423,587
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—359 **8 Claims**



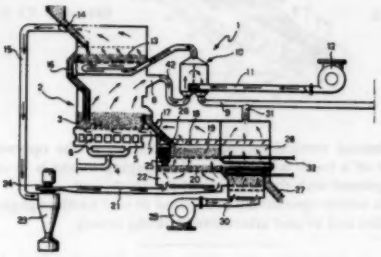
1. A multilamp photoflash array comprising:
a plurality of flashlamps;
an electrical circuit connected to said flashlamps and to a source and formed to energize said lamps individually and in sequence; and
radiation-responsive switches each including an admixture of individual particles of silver carbonate and silver coated glass beads and a binder integrated into said electrical circuit adjacent said flashlamps to receive radiant energy therefrom, each of said switches having a moisture barrier in the form of a thin radiation-translucent coating selecting from the group consisting of petroleum-based oils and waxes, organic polymers and polyethylene-based waxes, absorbed into said switches and enveloping said individual particles of said admixture.

4,478,572

PLANT AND METHOD FOR REGENERATING SAND FROM FOUNDRY CORES AND MOULDS BY CALCINATION IN A FLUIDIZED-BED FURNACE

Marino Selli, Turin, Italy, assignor to Fata Industriale S.p.A., Turin, Italy

Filed Dec. 28, 1982, Ser. No. 453,866
Claims priority, application Italy, Mar. 23, 1982, 67368 A/82
Int. Cl.³ F27B *14/00, 15/00*
U.S. Cl. 432—13 5 Claims



5. A method for regenerating sand from foundry cores and moulds in a fluidized bed calcining furnace having means for feeding a gaseous fuel and means for feeding air into a calcination bed formed by said sand so as to burn said fuel within, fluidize and calcine said sand bed to regenerate said sand and respective means for withdrawing regenerated sand and combustion fumes from said calcining furnace comprising:

heating a current of air in a first heat exchanger by means of fumes leaving said furnace;

preheating the sand to be regenerated in a second heat exchanger by means of the heated current of air;

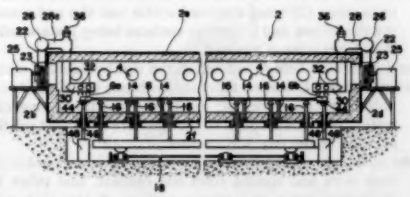
circulating the current of air leaving said second heat exchanger to a third heat exchanger to reheat said current of air by means of regenerated sand delivered from said currents to said third heat exchanger and feeding said reheated current of air to said calcination bed.

4,478,573

FURNACE FOR HEATING PIPES WITH UPSET PORTIONS

Hideo Kitayama, Mino, and Haruho Niwa, Tokai, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka and Kawasaki Steel Corp., Hyogo, both of, Japan

Filed Jan. 10, 1983, Ser. No. 457,030
Claims priority, application Japan, Jan. 13, 1982, 57-3464[U]
Int. Cl.³ F27B *9/14, 9/00*
U.S. Cl. 432—124 12 Claims



1. An improved furnace for heat treatment of objects requiring a variant rate of heat transfer to different portions of the object such as an elongated workpiece with an expanded end, comprising:

a heating chamber housing to permit the establishment of a predetermined temperature distribution within the housing for heat treatment of the object;

means for conveying the object through the housing in a predetermined spatial position so that the portion of the object requiring a higher rate of heat transfer is confined to a particular path of travel;

means for providing a flow of high temperature gas to the housing and towards at least a portion of the particular path of travel, and

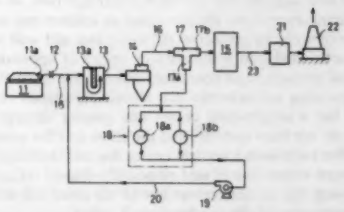
means for reflecting the flow of high temperature gas passing beyond the particular path of travel back towards the path of travel to ensure the availability of sufficient heat for the higher rate of heat transfer required by that portion of the object including a plate member defined by a series of arcuate faces occurring one after another, the plate member further capable of being heated to a temperature to radiate additional heat energy towards the particular path of travel.

4,478,574

SCRAP PREHEATING SYSTEM FOR AN ELECTRIC FURNACE

Ryuzo Okuno, Kobe; Keio Toyoda, Akashi; Masahiro Sarai, Kobe, and Kiyoshi Takai, Takagihigashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Godo Seitetsu Kabushiki Kaisha, Osaka, both of, Japan

Filed Aug. 24, 1982, Ser. No. 410,890
Claims priority, application Japan, Aug. 31, 1981, 56-137194; Jan. 8, 1982, 57-2127
Int. Cl.³ F27D *17/00*
U.S. Cl. 432—180 5 Claims

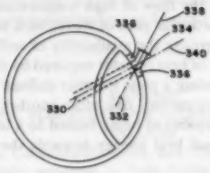


1. Apparatus for use in a system for preheating scrap utilizing exhaust gas from an electric furnace, the system including a first gas line connected to the furnace for passing relatively hot and dusty exhaust gas from the furnace to a chimney and then into the air, branch means connected in said first line for diverting a portion of the gas entering said branch means, a scrap preheater, and a second gas line connected to the branch means, to the first line and to the preheater for recirculating said portion of gas through the scrap preheater and to said first line at a junction between said furnace and said branch means, said apparatus comprising combustion means connected in said first line between said junction and said branch means for burning malodorous components of the gas, a regenerator connected in said first line between said combustion means and the chimney, a heat exchanger connected in said first line downstream from said branch means and said regenerator, and means in said second line for directing the gas from said preheater through said heat exchanger and then to said junction.

4,478,575
BLAST FURNACE STOVE OUTLET

Jack Hyde, Pittsburgh, Pa., assignor to Raymond Kaiser Engineers Inc., Oakland, Calif.

Continuation-in-part of Ser. No. 322,867, Nov. 19, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 510,262
Int. Cl.³ C21B 9/00; F28C 3/10
U.S. Cl. 432—217 **18 Claims**



1. In a stove for preheating air to be fed to a blast furnace, having a vertical shell lined internally with refractory brick work, said shell having a burner inlet aperture and hot blast outlet aperture, a partitioning wall extending vertically from a stove base so as to divide said stove internally into a checker chamber containing checkerbrick and a combustion chamber having external fluid communication through said burner inlet and hot blast outlet apertures, an upper means for providing fluid communication between the combustion chamber and the checker chamber, a means for introducing a fuel and air mixture into the combustion chamber through said burner inlet aperture so as to form hot combustion gases, a lower means for exhausting said hot combustion gases from the checker chamber after said combustion gases have passed over the checkerbrick and means for introducing air first into the checker chamber to be preheated by exposure to said checker bricks and then into the combustion chamber to be withdrawn through said hot blast outlet aperture, wherein the improvement comprises an elliptically-shaped refractory wall for peripherally reinforcing the hot blast outlet aperture, said wall having an outer peripheral side abutting the shell, an inner peripheral side adjacent the hot blast outlet aperture, an exterior end facing away from the stove and an interior end interiorly disposed with the respect to the stove and said wall being radially partitioned into a plurality of bricks of approximate dimensional similarity and connected side by side in an elliptically-shaped ring and wherein said elliptically-shaped refractory wall has a longitudinal center line passing through the center of the hot blast aperture and the stove and the combustion chamber each have a vertical center line and the longitudinal horizontal center line of said elliptically-shaped refractory wall intersects the vertical center line of the stove but not the vertical center line of the combustion chamber.

4,478,576
ORTHODONTIC ATTACHMENT PLACEMENT DEVICE

Rolf Maijer, Duncan, and James W. Starck, Victoria, both of Canada, assignors to Romada Holdings Ltd., Duncan, Canada

Continuation-in-part of Ser. No. 383,712, Jun. 1, 1982, Pat. No. 4,424,029. This application Jun. 13, 1983, Ser. No. 503,623
Int. Cl.³ A61C 7/00
U.S. Cl. 433—3 **30 Claims**

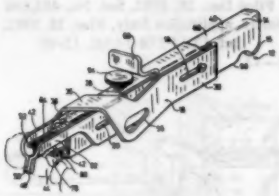
1. A placement device for orthodontic attachments, comprising:

tooth engaging means for engaging one side of a tooth,

orthodontic attachment holding means for holding an orthodontic attachment in engagement with the opposite side of a tooth,

means for moving said attachment holding means in a horizontal direction towards and away from said tooth engaging means for bringing an orthodontic attachment into engagement with the opposite side of a tooth when said tooth engaging means is in engagement with the one side of the tooth,

means for moving said attachment holding means in a vertical direction for positioning an orthodontic attachment in



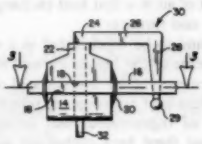
a desired vertical location with respect to the opposite side of a tooth when the tooth engaging means is in engagement with the one side of the tooth, and

handle means operatively connected to said tooth engaging means and to said attachment holding means.

4,478,577
ORTHODONTIC APPLIANCE

Richard F. Warren, Jr., 596 Granville Rd., Granville, Ohio 43023

Filed Aug. 9, 1983, Ser. No. 521,721
Int. Cl.³ A61C 7/00
U.S. Cl. 433—14 **6 Claims**



1. In the combination of a bracket mounted on a tooth, an arch wire and means for inhibiting rotation of both said tooth and said bracket with respect to said arch wire,

the bracket including a slot in its surface which faces away from said tooth, said slot being linearly extending in a direction generally perpendicular to the length of the tooth which extends from its root to its crown, two sides of the slot being planer and parallel,

a linearly extending aperture in said bracket of polylgonal shape extending the full length thereof in a direction perpendicular to said slot, said aperture being in the surface of said bracket which faces toward said tooth,

the arch wire (1) including two planer surfaces parallel to each other, (2) being disposed within said slot and extending therefrom, and (3) planer surfaces being juxtaposed to the planer sides of the slot,

said arch wire being confined in the slot by ligature wire,

a rigid device U-shaped mounted with one leg of the device within the aperture, the leg in the aperture being of a mating polygonal shape to the aperture such that relative rotation of the two is prevented,

the other leg of the U-shaped device being juxtaposed to the arch wire and spaced from the bracket, said other leg projecting from one planer surface of the arch wire toward the other and on the side of the arch wire nearest the tooth and terminating in a rounded shape, means forming a groove between said rounded shape and the rest of the other leg, said arch wire being wedged into said groove,

a ball mounted on said U-shaped device adjacent said shoul-

der by a neck section which is reduced in diameter as compared to said ball.

4,478,578

HANDLE FOR DENTAL CANAL ROTARY INSTRUMENT AND METHOD OF MANUFACTURING SAME

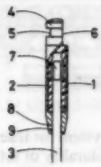
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France

Filed Feb. 1, 1982, Ser. No. 344,834

Claims priority, application France, Feb. 12, 1981, 81 02755

Int. Cl.³ A61C *3/02*

U.S. Cl. 433—165 **5 Claims**



1. A dental canal rotary instrument comprising:

an instrument shank having an inoperative rear end,

a cylindrical metal sleeve having at least one hole therein, said inoperative end of the shank being situated in the metal sleeve so that a gap is formed between the metal sleeve and the shank, and

a plastic material filling the hole in the sleeve and the gap between the metal sleeve and the shank so that the shank is immovably held inside the metal sleeve, said plastic material forming a head extending upwardly beyond the metal sleeve and the inoperative rear end of the shank, said head having a flat lateral face extending along the longitudinal direction thereof and an arcuate groove extending perpendicular to and up to the edges of the flat lateral face, said plastic material further forming a frusto-conical section extending downwardly from the sleeve to the shank.

4,478,579

SNUGLY FITTING DENTURE AND PROCESS OF ITS MANUFACTURE

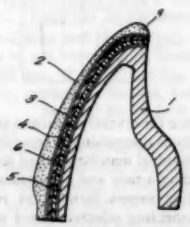
Wolfgang Fischer, Radeberg; Gerhard Gehre, Leipzig; Rainer Korf, Radeberg; Renate Lorenz, Radeberg, and Heinz Täschner, Radeberg, all of German Democratic Rep., assignors to VEB Kombinat Medizin- und Labortechnik Leipzig, Leipzig, German Democratic Rep.

Filed Mar. 29, 1982, Ser. No. 362,738

Claims priority, application German Democratic Rep., Jun. 4, 1981, 230576

Int. Cl.³ A61C *5/08, 5/10*

U.S. Cl. 433—222 **16 Claims**



12. A snugly fitting denture, comprising a metallic foundation, said metallic foundation being essentially composed of a dental base metal alloy having a silicon content of less than 0.5%, a first silane layer disposed on said metallic foundation, a first plastic layer disposed on the labial aspect of said first silane layer, whereby said first plastic layer is attached to said metallic foundation by said first silane layer, said first plastic layer comprising a tooth colored prosthesis plastic having an ascension-ratio such that the prosthesis plastic has the consistency of a highly fluid substance, a second plastic layer disposed on said first plastic layer, said second plastic layer being an adhesive plastic portion which is firmly bound to said first plastic layer by cold polymerization of said first plastic layer, a second silane layer disposed on the side of said second plastic layer opposite to said first plastic layer, and a ceramic facing shell, said ceramic facing shell being coupled to said second plastic layer by said second silane layer.

4,478,580

PROCESS AND APPARATUS FOR TREATING TEETH

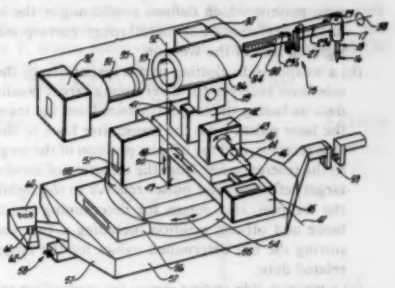
Luc P. Barrut, 14 Rue Robert, Lyon 6eme - Rhone, France

Filed Feb. 3, 1983, Ser. No. 463,369

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203937

Int. Cl.³ A61L *11/00*

U.S. Cl. 433—223 **32 Claims**



1. An apparatus for treating a tooth comprising:

a fixed element fixed in a predetermined position relative to said tooth;

rotary tool holding means movably interconnected with said fixed element;

probe means interconnected with said rotary tool holding means such as to be driven by said rotary tool holding means to rotate about a predetermined axis;

detector means interposed said rotary tool holding means and said probe means detecting the resistance force encountered by said probe means as said probe means is moved along the contours of said tooth and generating a first characteristic signal in response to said resistance force;

measuring means measuring the movements of said rotary tool holding means as said probe means is moved along the contours of said tooth and generating a second characteristic signal in response to said movements; and

automatic data processing means receiving said first characteristic signal and said second characteristic signal and storing said signals indicative of the shape of said tooth.

4,478,581

METHOD AND APPARATUS FOR SHOOTING SIMULATION OF BALLISTIC AMMUNITION WITH MOVABLE TARGETS

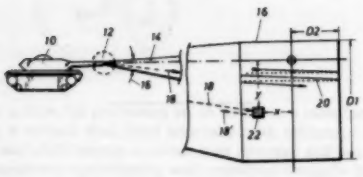
Wilfried Goda, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronics mbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,230

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114000

Int. Cl.³ G09B 9/00

U.S. Cl. 434—22 22 Claims



7. Apparatus for simulating shooting with ballistic ammunition from a weapon having a sighting axis onto a moving target using laser pulses transmitted from a weapon-side laser transmitter, the target including target-side retroreflectors for reflecting the laser pulses back to a weapon-side laser receiver, the apparatus comprising:

(a) a control means in said laser transmitter for controlling the transmitted pulses to repeatedly scan through a scanning pattern which defines a solid angle, the solid angle having a reference line therethrough corresponding to the sighting axis of the weapon;

(b) a weapon-side plotting means responsive to the weapon-side laser receiver for determining target position related data including the target distance from the transit time of the laser pulses from the transmitter back to the weapon-side receiver, and the off-aim position of the target relative to the reference line from the direction of incidence of the target reflected laser pulses relative to the sighting axis of the weapon, said means for determining the target distance and off-aim position including a first memory for storing the last determined values for the target position related data;

(c) a weapon-side coding means for controlling said control means at the time of each shot simulation to superimpose on the laser pulses a code representative of the last stored values for the target position related data, the target position related data including the time-of-flight for the projectile to reach the target and an elevation and lead angle which defines a predicted position for the target at the end of the flight time;

(d) a target-side measurement means including sensors for determining the direction of incidence of the transmitted laser pulses, for receiving the coded position related data, and for determining the travel speed of the target and the direction of travel relative to the measured direction of incidence; and

(e) a target-side plotting means responsive to said measurement means for determining actual target position related data at the end of the projectile flight time on the basis of the travel speed relative to the direction of incidence, said target-side plotting means including a comparison means for comparing the transmitted target position related data to the actual target position related data determined at the end of the flight time and for indicating a hit if they correspond.

4,478,582

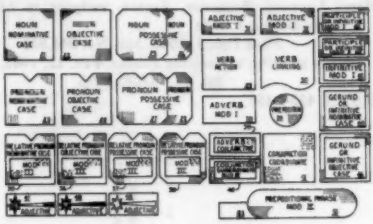
LANGUAGE SYNTAX EDUCATIONAL SYSTEM

Ruth L. Tucker, 1130 Pacific Beach Dr., San Diego, Calif. 92109

Filed Sep. 30, 1982, Ser. No. 429,963

Int. Cl.³ G09B 1/34

U.S. Cl. 434—170 20 Claims



1. An educational system for teaching and learning language syntax comprising a plurality of sets of individually manipulable members, each set comprising a plurality of identical members, the members from each set being distinguishable with respect to their color and shape, taken together, from the members of every other set, the color of each member being informative of the use of the member in a sentence, the shape of each member being infomative of the type of word, each member being adapted to bear word indicia so that the user can use combinations of members to synthesize phrases and clauses, members bearing foundation words being noticeably larger than those which bear non-foundation words, members having a square shape being indicative of words in nominative case, words in the objective case, action verbs, or coordinate conjunctions, members having a square shape with a notched edge being indicative of pronouns, members having a horizontal "s" shape being indicative of linking verbs, members having a rectangular shape significantly reduced in area from the square, notched square, and horizontal "s" shapes being indicative of modifiers, members having a circular ended shape being indicative of prepositions, and members having beveled corners being indicative of words in the possessive case.

4,478,583

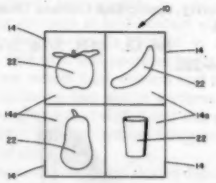
TEACHING DEVICE FOR SEVERELY RETARDED OR PHYSICALLY HANDICAPPED

Janet R. Sellers, 3211 Brentwood Rd., Raleigh, N.C. 27604

Filed Oct. 24, 1983, Ser. No. 544,488

Int. Cl.³ G09B 1/06; A63F 9/10

U.S. Cl. 434—259 6 Claims



1. A teaching device for severely retarded and/or physically handicapped individuals comprising: a separable board including a plurality of individual matching board sections with each board section including a face and a surrounding outer edge; detachable connecting means formed on respective board sections for interconnecting selected board sections together such that one board section can be detached and removed from another board section and said teaching device; said detachable securing means including tongue means projecting outwardly from the edge of selected board sections and groove means formed inwardly within the edge of selected board sections

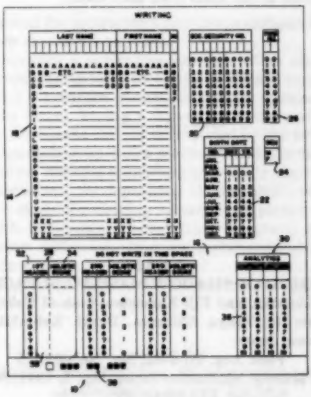
wherein the tongue and groove means are designed to mate with each other such that when joined together board sections thereof are secured together in side-by-side relationship; indented cutouts of a selected shape formed in the face of certain board sections; and a plurality of insert means with selected insert means being formed into a certain shape that matches the shape of a selected indented cutout in order that an individual may attempt to match a certain insert means with a certain indented cutout by attempting to fit the certain insert means within a certain cutout formed on a board section.

4,478,584

METHOD FOR RECORDING UNCODED SCORES OR RATINGS BY MULTIPLE EVALUATORS ON A SINGLE AUTOMATIC MACHINE SCANNABLE DOCUMENT

Kathryn Kaney, 12101 N. Dale Mabry, Apt. 902, Tampa, Fla. 33618

Filed Aug. 26, 1983, Ser. No. 526,618
Int. Cl.³ G09B *3/00*
U.S. Cl. 434—353 **11 Claims**



1. A method for recording uncoded scores or ratings by multiple evaluators on a single automatic machine scannable document while maintaining independence of ratings and accuracy of results; the method comprising a machine scannable grading including a scoring portion having a plurality of scoring areas, rating shields corresponding to at least all but one of said scoring areas to shield each said scoring area in succession to maintain independence of multiple uncoded ratings recorded on said grading sheet whereby the recorded ratings are machine readable through said rating shields.

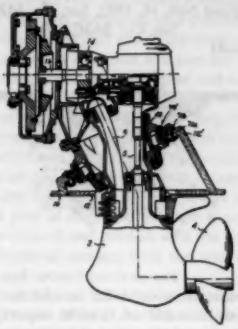
4,478,585

INBOARD OUTBOARD DRIVE AND MOUNTING SHIELD THEREFOR

Lennart Brandt, Fjärås, and Heinz Pichl, Upsala, both of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden

Filed Jan. 28, 1983, Ser. No. 461,876
Claims priority, application Sweden, Feb. 2, 1982, 82006032
Int. Cl.³ B63H *5/06*
U.S. Cl. 440—112 **20 Claims**

1. An inboard/outboard drive for use in a boat having an opening in the shell of the hull, comprising a structural part passing through the opening in the hull, support means attached to said structural part for supporting said structural part, a mounting shield having an inner annular portion and an outer portion, said inner annular portion having an outer periphery which is accommodated in the opening, said inner portion having receiver means for receiving said support means to carry said structural part, said receiver means is symmetrical relative to a plane of symmetry parallel with a plane in which the outer peripheric edge of said mounting shield lies, said outer annular portion is substantially defined by a flange having a body which is displaced to one side in regard



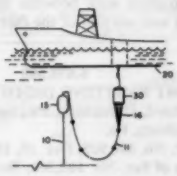
to said plane of symmetry and which, on its side located closer to said plane of symmetry, is provided with a contact face for sealing contact with an even face of the hull.

4,478,586

BUOYED MOONPOOL PLUG FOR DISCONNECTING A FLEXIBLE FLOWLINE FROM A PROCESS VESSEL

Larry L. Gentry, Sunnyvale; Herbert H. Moss, Cupertino, both of Calif.; Narayana N. Panicker, Grand Prairie, Tex., and William T. Wada, Sunnyvale, Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,039
Int. Cl.³ B63B *35/00*
U.S. Cl. 441—4 **5 Claims**



1. A buoyant moonpool plug for connecting a subsea flowline to a surface vessel comprising:

a cylindrical plug shell adapted for being drawn into a vessel moonpool;

central support column means for releasably attaching the moonpool plug to the turret of said vessel moonpool for rotation therewith;

internal plug support structure for attaching the support column to the plug shell at an upper portion of the plug shell;

a plurality of guide tubes connecting to the internal plug support structure and disposed in radial array around the central support column, said guide tubes extending downwardly to the bottom end of the plug shell for housing said subsea flowline;

a plurality of elongated buoyant tanks located inside the plug shell between guide tubes; and

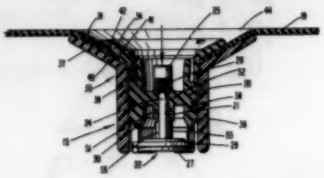
a plurality of transverse diaphragm plates for securing the guide tubes and tanks to the plug shell.

4,478,587

INFLATABLE BOAT VALVE AND MOUNTING THEREFOR

Glenn H. Mackal, 4923 59 Ave. S., St. Petersburg, Fla. 33702

Filed Nov. 16, 1982, Ser. No. 442,115
Int. Cl.³ B63C *9/04*
U.S. Cl. 441—41 **13 Claims**



1. In combination: a valve for us with an inflatable article having side walls made of flexible impervious fabric, and means for attaching and sealing the valve to the article at an opening through the side wall thereof, said valve comprising a hollow valve body having a fixed valve seat therein, a valve element within the valve body and selectively movable into and out of sealing engagement with the valve seat, and resilient means constantly urging the valve element toward and into sealing engagement with the valve seat, the means for attaching and sealing the valve to the article comprising a nut screwed onto the valve body, the nut having a first, axially outwardly expanding rigid frusto-conical flange on its axially outer end, said first flange underlying the portion of the fabric which surrounds the opening through the side wall of the article, a second rigid frusto-conical flange attached to the valve body, said second flange being coaxial with and substantially parallel to the first flange, said second flange overlying at least a part of the portion of the fabric which surrounds the opening through the side wall of the article and which overlies the first flange, the two flanges forcibly engaging opposite sides of the said portion of the fabric, whereby to force said portion into a frusto-conical configuration, parallel to and between the confronting surfaces of the first and second flanges, and to form seals between them and the respective surfaces of the said portion of the fabric which they engage.

4,478,588

LIGHT EMITTING DIODE ASSEMBLY

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 330,925, Dec. 15, 1981, abandoned, which is a continuation of Ser. No. 102,308, Dec. 11, 1979, abandoned, which is a division of Ser. No. 883,559, Mar. 6, 1978, Pat. No. 4,247,864, which is a continuation-in-part of Ser. No. 816,423, Jul. 18, 1977, abandoned. This application Aug. 3, 1983, Ser. No. 519,221
Int. Cl.³ H01L *21/52, 21/60*; H05B *33/06, 33/22*
U.S. Cl. 445—22 **6 Claims**

1. A method for providing light emitting diodes with lenses and leads, the steps comprising:

forming an opening in a strip of electrically conducting material,

forming a pair of elongated leads from a portion of said material and extending from opposite sides of said opening,

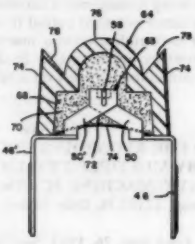
forming from another portion of said strip a pair of resilient contact fingers, each having one end secured to the end of the corresponding lead adjacent the opening with the other ends of the contact fingers biased against each other to provide a space outlined by said fingers,

inserting a tool though said opening to move apart said other end of each pair of fingers against their bias while said fingers are being carried by the strip,

inserting a diode between said pair of moved apart fingers,

removing said tool to permit said fingers to grip and suspend said diode over the opening,

encapsulating said diode together with portions of said fingers in a light transmitting encapsulant material, and



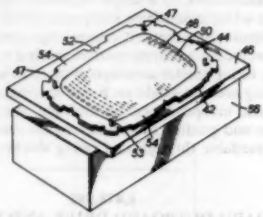
removing the remainder of the material of the strip to permit isolation of the leads from each other.

4,478,589

METHOD OF SHADOW MASK MANUFACTURE

Shigeo Takenaka, and Eiji Kamohara, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 19, 1982, Ser. No. 409,355
Claims priority, application Japan, Sep. 2, 1981, 56-137001
Int. Cl.³ H01J *29/07, 9/14*
U.S. Cl. 445—37 **7 Claims**



1. A method of making masks for a cathode ray tube (CRT) comprising the steps of:

stacking two (2) flat masks, each mask comprises an effective portion having a plurality of apertures, a non-effective portion surrounding said effective portion and welding portions located the periphery of said non-effective portions;

applying a magnetic force to said flat masks to hold them in contact with each other;

welding said flat masks together at their respective welding portions;

releasing said welded flat masks from said magnetic force;

simultaneously pressing said welded flat masks into the predetermined curvature; and

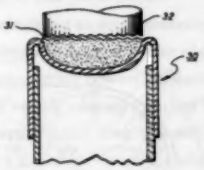
cutting off said welding portions from the masks.

4,478,590

DEPRESSION CATHODE STRUCTURE FOR CATHODE RAY TUBES HAVING SURFACE SMOOTHNESS AND METHOD FOR PRODUCING SAME

Thaddeus V. Rychlewski, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,301
Int. Cl.³ H01J 9/04
U.S. Cl. 445—50 6 Claims



1. Method for producing a depression cathode structure for a cathode ray tube, comprising:

(a) providing a supporting substrate of an alloy of nickel comprising about 2 to 4 weight percent tungsten, up to about 0.1 weight percent zirconium, remainder substantially nickel, having a depression in the surface thereof, the depression entirely surrounded by the substrate,

(b) dispensing drop-wise a predetermined quantity of a liquid cathode material containing potentially electron emissive material into the depression, the potentially electron emissive material consisting essentially of particles of alkaline earth carbonates selected from the group consisting of barium carbonate, strontium carbonate and calcium carbonate, and

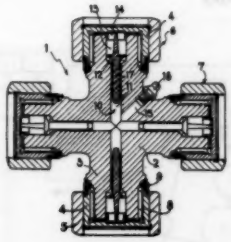
(c) drying the liquid cathode material to form a cathode layer in the depression.

4,478,591

LUBRICATING DEVICE, IN PARTICULAR FOR A UNIVERSAL JOINT SPIDER

Jacques Mangiavacchi, Poissy, France, assignor to Glaenzer Spicer, Poissy, France

Filed Dec. 28, 1982, Ser. No. 453,956
Claims priority, application France, Jan. 7, 1982, 82 00127
Int. Cl.³ F16D 3/26
U.S. Cl. 464—14 10 Claims



1. A lubricating arrangement comprising:

a member having therein a conduit including a first portion adapted to receive from a first end thereof a supply of lubricant and a second portion having a first end connected to a second end of said first portion, said second portion having a diameter greater than said first portion;

a member defining a surface extending transverse to said conduit at a second end of said second portion of said conduit; and

means for allowing the restricted flow of lubricant from said first portion of said conduit to said second end of said second portion of said conduit and for preventing the flow of lubricant in the reverse direction, said means comprising a solid member including a first part having a diameter less than the diameter of said first portion of said conduit, a second part integral with said first part and in the form of a flexible skirt extending outwardly from said first part and having an outer diameter greater than said diameter of said second portion of said conduit, and a third part integral with said first and second parts and extending axially therefrom, said solid member being positioned in said conduit such that:

said first part of said solid member fits in said first portion of said conduit and defines therewith a constricted passage opening into said second portion of said conduit;

said second part of said solid member is positioned in said second portion of said conduit with the outer edge of said skirt in frictional contact with the wall of said member defining said second portion; and

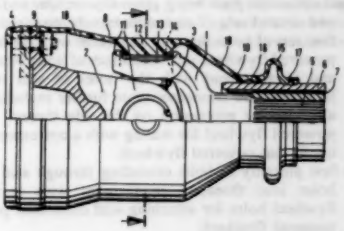
said third part of said solid member is positioned in said second portion of said conduit and abuts against said transverse surface.

4,478,592

UNIVERSAL JOINT SEALING ASSEMBLY

Werner Krude, Siegburg-Kaldauen, and Karl-Heinz Müller, Wissen, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 421,862
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140542
Int. Cl.³ F16D 3/84
U.S. Cl. 464—173 5 Claims



1. A universal joint assembly comprising:

a universal joint including a pair of joint yokes and a cross member interconnecting said joint yokes;

a first shaft member and a second shaft member connected, respectively, to each of said joint yokes; and

a sealing boot formed of resilient material and having first and second opposite ends, with said first end connected to said first shaft member and with said second end connected to said second shaft member, said sealing boot extending continuously between said first and second ends thereof to completely cover said universal joint;

said sealing boot comprising

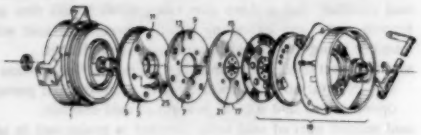
an annular securing portion intermediate said first and said second ends located to extend circumferentially about said joint yokes, and

a plurality of internal formations uniformly spaced circumferentially apart about said joint yokes and extending inwardly from said annular securing portion, each of said formations engaging said joint yokes to provide additional fixing means supporting said sealing boot in sealing engagement over said universal joint.

4,478,593
COUPLING OF UNRELATED ENGINE AND TRANSMISSION

Gordon Brown, Champlain Dr., Greenville, S.C. 29611

Filed Jun. 8, 1981, Ser. No. 271,439
Int. Cl.³ F16D 1/06; F02F 7/00
U.S. Cl. 464—182 1 Claim



1. In a drive train within a motor vehicle having an internal combustion engine coupled to an unrelated transmission assembly by a connector plate;

said internal combustion engine comprising a powered flywheel having a ring gear attached thereon and a housing to house said powered flywheel;

said transmission assembly including a transmission flywheel, a pilot bearing disposed in the center of said transmission flywheel and a pilot shaft engaging said pilot bearing, wherein said transmission flywheel is attached to said transmission assembly through said pilot shaft;

a transmission housing related to and housing said transmission assembly;

an annular disc disposed between and attaching said engine housing and transmission housing, said annular disc being of a thickness so as to permit said transmission housing to operate in conjunction with said connector plate and said transmission assembly to operate as originally intended;

said powered flywheel and said transmission flywheel each having a plurality of circumferentially disposed holes, the holes of said powered flywheel being threaded;

said connector plate being generally circular and having first and second sets of circumferentially disposed holes, said first sets of holes being in alignment with the holes of said powered flywheel, said second set of holes being threaded and in alignment with the holes of said transmission flywheel, said connector plate further including a generally circular protrusion on the side thereof facing said powered flywheel for mating with a corresponding opening in said powered flywheel;

a first plurality of bolts extending through said first set of holes into threaded engagement with said powered flywheel holes for attaching said connector plate to said powered flywheel;

a second plurality of bolts extending through said transmission flywheel holes into threaded engagement with said second set of holes for attaching said connector plate to said transmission flywheel; and

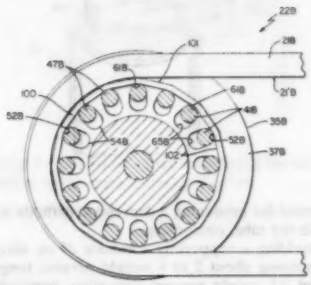
said connector plate having a third set of circumferentially spaced holes defining threaded openings therethrough for disengaging said connector plate from said powered flywheel when bolts are tightened through said third set of holes.

4,478,594
BELT TENSIONING MEANS

Melvin D. Gayer, Rock Prairie Township, Dade County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 10, 1982, Ser. No. 376,471
Int. Cl.³ F16H 55/54, 11/06, 9/10
U.S. Cl. 474—50 6 Claims

1. In a combination of a power transmission belt that is adapted to be operated with a varying speed of movement in an endless path and a tensioner comprising a support means fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, biasing means operatively associated with said support means and said belt engaging means urging said belt engaging means relative to said support means in a belt tensioning direction and against said belt with a force to tension said belt, and control means operatively associated with said biasing means to progressively decrease its urging force on said belt engaging means as said speed of movement of said belt progressively increases from a certain low speed of movement thereof to a certain high speed of movement thereof, said tensioner comprising a pulley having a variable speed of rotation and being adapted to progressively reduce its effective diameter as said speed of rotation

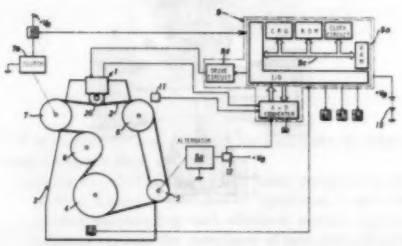


thereof progressively increases from a certain low speed of rotation thereof to a certain high speed of rotation thereof, said pulley having a rotatable hub that comprises said support means and has an effective diameter defining means carried by said hub that comprises said belt engaging means, said biasing means being operatively disposed between said hub and said diameter defining means, an improvement wherein said belt said a bottom driving surface and said diameter defining means comprises an endless flexible sleeve adapted to be engaged and rotated by said bottom driving surface of said belt.

4,478,595
ELECTRIC CONTROL APPARATUS FOR BELT TENSIONERS

Hideyuki Hayakawa, Nishio; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake, and Hiroji Kinbara, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 25, 1982, Ser. No. 361,616
Claims priority, application Japan, Mar. 27, 1981, 56/45951
Int. Cl.³ F16H 7/12
U.S. Cl. 474—109 6 Claims



1. In combination with a belt tensioner device for use in automotive vehicles for automatically controlling tension of an endless belt of a drive system in which an output torque of a prime mover of the vehicle is transmitted to a plurality of accessory devices by means of said belt, said belt tensioner device including idler pulley means in engagement with said endless belt to apply a tensioning force on said belt in accordance with radial displacement thereof, and actuator means operatively connected with said idler pulley means for effect-

ing radial displacement of said idler pulley means toward and away from said belt,

an electric control apparatus for said belt tensioner device comprising:

first means for generating a first signal indicative of the radial displacement of said idler pulley means;

second means for generating a second signal indicative of rotational speed of said prima mover;

third means for calculating an actual tensioning force acting on said belt in dependence upon a value of said first signal, and for calculating drive powers respectively necessary for driving said vehicle accessory devices in relation to a value of said second signal from said second means, and for calculating a total drive torque for said vehicle accessory devices in relation to the value of said second signal and all the calculate drive powers, said third means being arranged to calculate an optimum tensioning force related to said calculated total drive torque for said accessory devices on a basis of a predetermined relationship between the optimum tensioning force and said total drive torque in consideration with a maximum efficiency of power transmission by said belt and being further arranged to generate a control signal therefrom when the calculated actual tensioning force is different from the calculated optimum tensioning force; and

means responsive to the control signal from said third means for operating said actuator means in accordance with the difference between the calculated actual and optimum tensioning forces.

4,478,596

DELIVERY SYSTEM FOR PHYSIOLOGICALLY ACTIVE AGENTS

Paul E. Michelson, 2280 Calle Tiara, La Jolla, Calif. 92037

Filed Nov. 26, 1982, Ser. No. 444,376
Int. Cl.³ A61M 5/00
U.S. Cl. 604—890 9 Claims

1. A system for the controlled delivery of a physiologically active agent to a fluid environment comprising:

a semipermeable sheath defining a fully enclosed cavity and being imperforate except for a plurality of pores for permitting the flow of fluid from the fluid environment into said cavity; and

a quanitity of a molecular complex positioned in said cavity, said molecular complex comprising a macromolecule that is nondiffusable with respect to said sheath and a physiologically active agent complexed to said macromolecule, said physiologically active agent being capable of dissociating from said macromolecule over time and going into solution with the fluid in said cavity, and said pores having a larger size in relation to said physiologically active agent and said sheath being so constructed as to permit unimpeded passage of said physiologically active agent through said pores out of said cavity, wherein the concentration of said physiologically active agent within said cavity is controlled by the equilibrium between said molecular complex and said physiologically active agent within said cavity and said physiologically active agent is deliverable by said system to the fluid environment exclusively through said plurality of pores.

4,478,597

METHOD OF TREATING TEXTILES

Jerry H. Hunsucker, Terre Haute, Ind., assignor to Angus Chemical Company, Northbrook, Ill.

Filed Jun. 20, 1983, Ser. No. 505,798
Int. Cl.³ D06M *13/38*
U.S. Cl. 8—181 9 Claims

1. A method of preparing a wrinkle-resistant fabric made from natural fibers consisting of the steps of (a) impregnating the fabric with a solution consisting essentially of tris(hydroxymethyl)nitromethane or a mixture thereof with 2-nitro-1-butanol or 2-nitro-2-methylpropanol and catalyst therefor, and (b) heating to 150°–170° C.

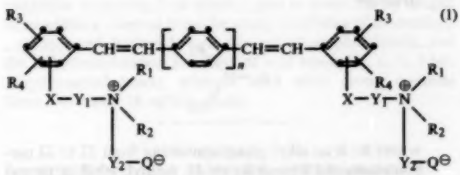
4,478,598

AMPHOTERIC STYRENE DERIVATIVES USEFUL AS FLUORESCENT BRIGHTENERS

Hans R. Meyer, Binningen, and Max Morf, Schönenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,837
Claims priority, application Switzerland, Feb. 26, 1981, 1295/81
Int. Cl.³ C11D *3/42;* D06L *3/12*
U.S. Cl. 8—648 14 Claims

1. An amphoteric styrene derivative of the formula



(1)

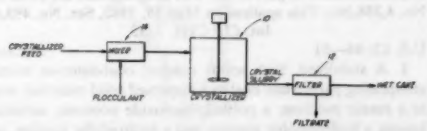
in which X is oxygen, sulfur, a direct bond, $—SO_2N(R_5—$, $—CON(R_5—$ or —COO—, Y_1 and Y_2 independently of one another are C_1–C_4-alkylene or hydroxypropylene, R_1 and R_2 independently of one another are C_1–C_4-alkyl or, together with the N atom, are a pyrrolidine, piperidine, hexamethyleneimine or morpholine ring, and R_1, together with R_5, is also a piperazine ring, R_3 and R_4 are hydrogen, C_{1-4}-alkyl, chlorine, C_{1-4}-alkoxy or C_{3-4}-alkenyl or together, in the o-position relative to one another, are a trimethylene or tetramethylene group, R_5 is hydrogen, C_{1-4}-alkyl or cyanoethyl or, together with R_1, is a piperazine ring, Q is —COO or $—SO_3$ and n is the number 1 or 2.

4,478,599

METHOD OF CONTINUOUSLY CONTROLLING CRYSTAL FINES FORMATION

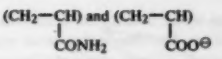
Avinash D. Puri; James B. Rodosevich, both of Ridgecrest, and James L. Fairchild, Trona, all of Calif., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 25, 1982, Ser. No. 382,048
Int. Cl.³ B01D *9/02;* C01D *7/24, 7/40*
U.S. Cl. 23—300 6 Claims



1. In a continuous process for the crystallization of sodium bicarbonate from a mother liquor containing crystallizable sodium bicarbonate in a crystallization zone in which process crystal fines of said sodium bicarbonate are formed, the improvements which comprise:

continuously converting said crystal fines formed in said crystallization zone to large spherulitic crystals by continuously adding to said mother liquor containing said crystallizable sodium bicarbonate a flocculent having structural units selected from the group consisting of



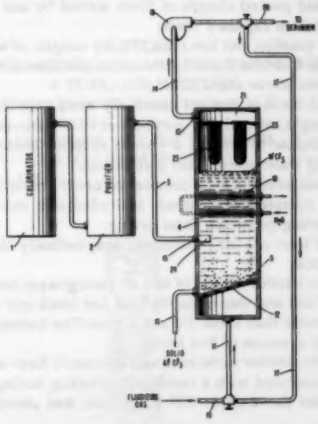
said flocculent being added to the mother liquor when the temperature of said mother liquor in said crystallization zone is about 110° F. or less and in an amount sufficient to provide for said continuous conversion of the crystal fines to large spherulitic crystals.

4,478,600

PROCESS FOR RECOVERY OF ALUMINUM CHLORIDE

Ronald C. Schoener, Lower Burrell, Pa.; Larry K. King; Lester L. Knapp, both of Maryville, Tenn., and Nicholas Kloap, Benton, Ark., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 567,506, Apr. 14, 1975, abandoned, which is a continuation of Ser. No. 392,569, Aug. 29, 1973, abandoned, which is a division of Ser. No. 180,277, Sep. 14, 1971, abandoned. This application Dec. 13, 1976, Ser. No. 750,118
Int. Cl.³ B01D *53/12*
U.S. Cl. 23—313 FB 11 Claims



1. Process for the recover of aluminum chloride from a gas containing gaseous aluminum chloride, comprising the steps of desubliming said gaseous aluminum chloride on particles of aluminum chloride in a self-replenishing fluidized bed thereof maintained by introduction of substantially aluminum chloride free gas at the lower perimetrically defining boundary thereof and at a temperature below the upper ambient desublimation temperature of aluminum chloride introducing gaseous aluminum chloride at a temperature above the upper ambient desublimation temperature thereof into the said fluidized bed at a location remote from the locus of introduction of said substantially aluminum chloride free gas, and removing selectively sized flowable particles of aluminum chloride from said fluidized bed.

4,478,601

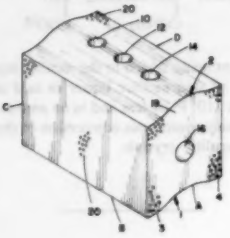
COAL BRIQUETTE AND METHOD

Leonard Stephens, R.D. #1, Box 671, McClellandtown, Pa. 15458

Continuation-in-part of Ser. No. 229,977, Jan. 30, 1981, abandoned. This application Jan. 6, 1983, Ser. No. 456,107

Int. Cl.³ C10L 5/36, 5/32

U.S. Cl. 44—14 **17 Claims**



1. A combustible fuel block comprising:

(a) a major amount in excess of about 60% by weight of a water-wetted particulate hydrocarbon fuel;

(b) said fuel characterized by BTU content of in excess of about 10^4 BTU/lb. and about 1.0×10^6 BTU/cu.ft.;

(c) said particulates not appreciably larger than about one inch, but principally retained on a 100 mesh screen;

(d) interstitially dispersed among said fuel particulates a minor amount of a small but effective quantity of slacked or burned lime and a relatively larger amount but less than about 25% by weight of macro clumps of capillary spaced apart combustible natural and/or synthetic fibers;

(e) said packed clumps of fibers wetted by and holding by inherent capillary voids;

(f) a quantity, but less than 25% by weight, of said particulate fuel of a fluent hydrocarbon distillate having a flash point above about 80° F.;

(g) an amount, but not essentially more than about 5% by weight, of said fuel particulates of a water soluble alkyl cellulose to provide a viscous adhesive binder phase for said water-wetted fuel particulates;

(h) said admixed mass compressed under pressures sufficient to compress and extrude said admixture into a self-supporting geometric form having:

(i) at least one air passageway longitudinally through said block;

(j) the interior surface of said air passageways having a ratio of unit area thereof to the total fuel block unit volume not greater than about 1:1 and a mean-free burning time period in excess of five hours;

(k) the exterior surfaces of said geometric form substantially overcoated with a combustible coating having a melting point above about 100° F., but less than about 225° F.

4,478,602

CARBONACEOUS OIL SLURRIES STABILIZED BY BINARY SURFACTANT MIXTURES

Edwin L. Kelley, Succasunna; Walter J. Herzberg, Fair Lawn, and Joseph V. Sinka, Mendham, all of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

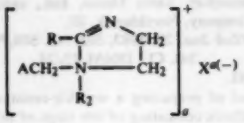
Filed Feb. 12, 1982, Ser. No. 348,238

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 **8 Claims**

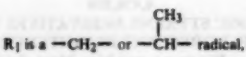
1. An oil slurry of particulate carbonaceous material stabilized with an effective amount of a binary surfactant mixture using (A), (B) and (F) surfactants where

(A) is an imidazoline quaternary salt of the structure:



wherein:

R is a hydrocarbon radical having 9 to 23 carbon atoms, A is R_1OH or CH_2NHCOR' where R' is an alkyl group having from 1 to 17 carbon atoms,



R_1 is a $-CH_2-$ or $-\underset{}{\overset{CH_3}{\overset{|}{C}}}H-$ radical,

R_2 is hydrogen, an unsubstituted or hydroxy-substituted aliphatic hydrocarbon radical having 1 to 6 carbon atoms or a benzyl radical, X is a water-soluble anion, and a is a number equal to the ionic valence of the anion, X,

(B) is a condensation product of one mole of ethylene diamine with about 80 moles of propylene oxide and then with about 20 moles of ethylene oxide, and

(F) is a quaternary salt of an amine having the following structure:

where R_1 is an alkyl group containing from 12 to 22 carbon atoms and R_2 and R_3 are H, methyl, ethyl or propyl and R_2 and R_3 can be the same or different,

selected from the group consisting of:

(i) from about 0.25 to about 0.75 parts by weight of (A) to about 0.75 to about 0.25 parts by weight of (B) and

(ii) from about 0.25 to about 0.75 parts by weight of (A) to about 0.75 to about 0.25 parts by weight of (F).

4,478,603

COAL-AQUEOUS MIXTURES COMPRISING NONIONIC AND ANIONIC SURFACTANTS

Seymour Mark, Northampton, Pa., assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 416,606, Sep. 10, 1982, , which is a continuation-in-part of Ser. No. 230,062, Jan. 29, 1981, Pat. No. 4,358,293. This application May 18, 1983, Ser. No. 495,628

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 **54 Claims**

1. A stabilized, high solids content coal-aqueous mixture comprising particulate coal as a dispersed solid material; water as a carrer medium; a polyalkyleneoxide nonionic surfactant having a hydrophobic portion and a hydrophilic portion, said hydrophilic portion comprising at least about 100 units of ethylene oxide and a polyelectrolyte surfactant, said polyalkyleneoxide nonionic surfactant and said polyelectrolyte surfactant being present in said mixture in an amount sufficient to disperse said particulate coal in said water carrier.

4,478,604

GASOLINE COMPOSITIONS CONTAINING BRANCHED CHAIN AMINES OR DERIVATIVES THEREOF

Alexander D. Schuettenberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 1, 1982, Ser. No. 364,361
Int. Cl.³ C10L 1/22
U.S. Cl. 44—63 8 Claims

1. A fuel composition containing a rust-inhibiting amount of at least one additive selected from:

(a) 5,7,7-trimethyloctylamine,

(b) a reaction product of 5,7,7-trimethyloctylamine and a C_{1-12} monocarboxylic acid or ester and

(c) a reaction product of 5,7,7-trimethyloctylamine and a C_{2-24} polycarboxylic acid, hydrocarbyl ester, or anhydride.

4,478,605

ALKYLATED 5,6,7,8-TETRAHYDRONAPHTHALENOLS AS ANTIOXIDANTS

Bruce E. Firth, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 299,707, Sep. 8, 1981, Pat. No. 4,392,969. This application Apr. 25, 1983, Ser. No. 488,227
Int. Cl.³ C10L 1/18
U.S. Cl. 44—78 13 Claims

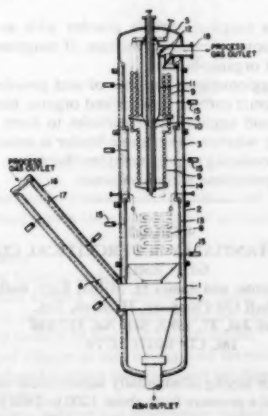
1. A composition comprising a fuel oil tending to undergo oxidation containing from about 5 ppm to about 5% by weight of an additive selected from the group consisting of monoalkyl-, dialkyl- and trialkyl-5, 6, 7, 8-tetrahydronaphthalenols, and the dehydrocylization products of said trialkyl-5, 6, 7, 8-tetrahydronaphthalenols, wherein each alkyl group contains from 3 to about 16 carbon atoms.

4,478,606

SUBSTANTIALLY VERTICAL APPARATUS FOR COOLING PROCESS GASES ORIGINATING FROM A GASIFICATION PROCESS

Rolf Dörling, and Ulrich Premel, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,872
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137576
Int. Cl.³ C10J 3/84, 3/86
U.S. Cl. 48—77 1 Claim



1. A substantially vertical apparatus for cooling process gases originating from a gasification process, and for simultaneously separating off solid matter contained in said process gases, said apparatus comprising:

a cylindrical container having a container mantle and including several cylindrical container parts;

a cyclone in the lower cylindrical container part;

a gas inlet conduit arranged substantially tangential to said container mantle and in communication with said cyclone;

means for cooling the process gases prior to entry into said cyclone;

an outlet, for solid material, located below said cyclone;

cooling surfaces arranged above said cyclone, including platen heat transfer surfaces directly above said cyclone, and cylindrical heat transfer surfaces above said platen heat transfer surfaces, each of said heat transfer surfaces being located within a different cylindrical container part;

support elements in said container and on which said cylindrical heat transfer surfaces are suspended in the manner of an immersion heater;

a tube surrounding said support elements;

an outlet for process gas, connected to said tube;

a regulating device in said gas outlet, said support elements, in conjunction with said tube and said regulating device, being adapted to regulate the volume of process gas flowing around the upper portion of said cylindrical heat transfer surfaces;

container-wall cooling surfaces on the inner wall of said container mantle in the form of vertical heat transfer surfaces having a tube-crosspiece-tube construction;

a packing mass located between the outer wall of said container mantle and said container-wall cooling surfaces for centering the latter relative to said outer wall; and

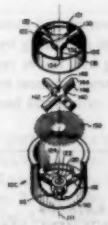
cleaning elements associated with said container for cleaning said heat transfer surfaces.

4,478,607

DEVICE FOR ATOMIZING AND DISPERSING FUEL IN A FUEL/AIR MIXTURE

Timothy L. Capps, Knoxville, Tenn., assignor to Turra International, Inc., Atlanta, Ga.

Filed Aug. 3, 1983, Ser. No. 519,803
Int. Cl.³ F02M 29/02, 29/04
U.S. Cl. 48—189 3 Claims



1. An atomizer/fuel mixer for atomizing and dispersing fuel in a moving fuel/air mixture comprising an external cylindrical barrel having an axis, first bearing support means integrally formed at one end of the external barrel symetric with the axis, and supporting a bearing aligned with the axis, an internal cylindrical barrel press fit within the external barrel and concentric therewith, second bearing support means integrally formed at one end of the internal barrel, symetric with the axis, and supporting a bearing aligned with the axis, a propeller with a shaft fit thereto and mounted for rotation between the bearings supported by the first and second bearing support means.

4,478,608

METHOD OF TREATING PROCESS GASES COMING FROM A GASIFICATION REACTOR

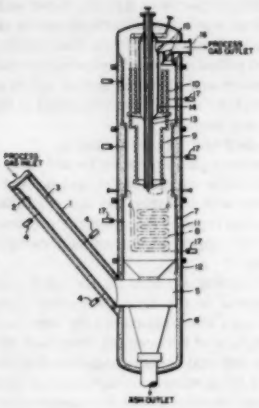
Rolf Dörling, and Ulrich Premel, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,871

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137586

Int. Cl.³ C10J *3/84, 3/86*

U.S. Cl. 48—210 1 Claim



1. A method of treating process gases, coming from a gasification reactor, prior to entry of said gases into a system of waste heat utilization, said method occurring in a single pressure container and including the successive steps of:

first cooling down said process gases to a temperature of at least 800° C. prior to entry thereof into said waste heat system;

then extensively freeing said process gases of solid matter in a cyclone separator system; and

finally further cooling down said process gases to a temperature of at least 250° C. in a convective cooling system, said first cooling down prior to entry of said process gases into said waste heat system occurring by means of indirect heat exchange;

said further cooling down of said process gases in the convective cooling system occurring by means of wall cooling surfaces including in a lower region of a convective cooling zone with platen-type heat transfer surfaces and in an upper region with cylindrical heat transfer surfaces.

4,478,609

VENEER FINISHING MACHINE

John DeLigt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 403,160, Jul. 29, 1982,. This application Mar. 19, 1984, Ser. No. 591,016

Int. Cl.³ B24B *1/00*

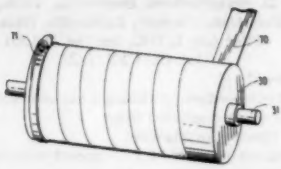
U.S. Cl. 51—295 1 Claim

1. A method of covering a drum grinding tool with a disposable abrasive surface comprising the steps of:

selecting an abrasive belting material having a width of no more than half of the axial length of a cylindrical surface of said drum grinding tool;

helically wrapping said belting material about said cylindrical surface with at least one full helical period; and,

securing respective cylindrical ends of said belting material ends with overlying surface clamps disposed outside of a



worked material width segment of said cylindrical surface length.

4,478,610

METHOD OF PREPARING FLEXIBLE BACKING MATERIAL FOR USE IN COATED ABRASIVES

Dhan N. Parekh, Williamsville, and Paul R. Schweyen, Tonawanda, both of N.Y., assignors to Carborundum Abrasives Company, Niagara Falls, N.Y.

Division of Ser. No. 412,149, Aug. 27, 1982, Pat. No. 4,437,865. This application Feb. 6, 1984, Ser. No. 577,046

Int. Cl.³ C09K *3/14*

U.S. Cl. 51—298 14 Claims

1. A method of preparing flexible sheet material of the type including a straight warp fabric, including the steps of:

(a) wetting all exposed surfaces of the fabric with an aqueous solution of polyvinyl alcohol;

(b) drying the polyvinyl alcohol wetted fabric under tension to produce a polyvinyl alcohol dipsized fabric;

(c) applying a filling of phenolic formaldehyde resin/latex mixture to the polyvinyl alcohol dipsized fabric;

(d) applying an outer coating of phenol formaldehyde resin including an inorganic pigment dispersed therein.

4,478,611

METHOD OF MAKING TUNGSTEN CARBIDE GRIT

Gary F. Selden, Mt. Clemens, Mich., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 14, 1979, Ser. No. 103,720

Int. Cl.³ B24D *3/02*

U.S. Cl. 51—307 6 Claims

1. A method for preparing a tungsten carbide grit which comprises:

(a) blending a tungsten carbide powder with an organic binder to form a powdered mixture of tungsten carbide powder and organic binder;

(b) forming agglomerated particles of said powdered mixture of tungsten carbide powder and organic binder; and

(c) sintering said agglomerated particles to form tungsten carbide grit, wherein the organic binder is selected from the group consisting of polymethylmethacrylate, polyethylene, polypropylene and polystyrene.

4,478,612

DRYING SUBSTANTIALLY SUPERCRITICAL CO_2 WITH GLYCEROL

Zaida Diaz, Houston, and James H. Miller, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 27, 1983, Ser. No. 517,594

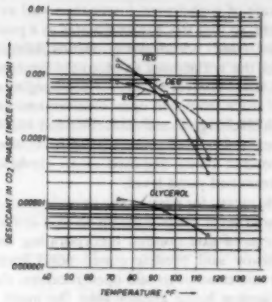
Int. Cl.³ B01D *53/14*

U.S. Cl. 55—29 5 Claims

1. A process for drying substantially supercritical moist CO_2 to provide CO_2 at a pressure from about 1200 to 2400 psi which comprises:

flowing a stream of moist CO_2 into and out of contact with sufficient glycerol to effect substantial drying while the CO_2 being contacted has a pressure between about 1200

and 2400 which is high enough and a temperature between about 70° to 120° F. which is low enough to substantially minimize the required amount of compressor horsepower



while desiccant loss, product contamination and heat requirements are substantially minimized by the limited mutual solubility of the glycerol and supercritical CO_2.

4,478,613

APPARATUS TO REMOVE SOLID PARTICLES AND AEROSOLS FROM A GAS, ESPECIALLY FROM THE EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

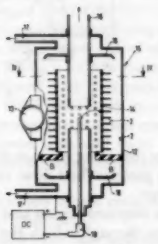
Johannes Brettschneider, Ludwigsburg; Klaus Dobler, Gerlingen; Gottlob Haag, Oberriexingen; Ernst Linder, Mühlacker, and Wilhelm Polach, Möglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,693

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141156

Int. Cl.³ B03C *3/14*

U.S. Cl. 55—127 **2 Claims**



1. Apparatus to remove solid particles and aerosols from a gas, especially from the exhaust gas of an internal combustion engine,

comprising

a closed housing structure;

electrodes formed with projecting points or teeth located within said closed housing structure, the teeth facing an inside surface of said housing structure;

electrical charge means having one terminal connected to said closed housing structure, and another terminal to said electrodes;

combustion exhaust gas conducting means (13) conducting exhaust gas including the particles and aerosols into the closed housing structure and in a space between the inside surface of the closed housing structure and said teeth, the inside surface of the closed housing structure forming a precipitating surface for collection of solid particles and aerosols in the form of flakes and agglomerates thereon;

a mechanical separator (15) further connected to said space within the closed housing structure to receive exhaust gas and flakes and agglomerates carried along therewith;

and two outlet means (16, 17) from said mechanical separator, one (16) of said outlet means carrying gas essentially free from solid particles, flakes and agglomerates, and the other of said outlet means (17) carrying gas essentially free from solid particles and aerosols but enriched with said flakes and agglomerates,

wherein the mechanical separator (15) and the closed housing structure comprise a single element forming a centrifugal or turbulence chamber (15) of generally circular cross section having an inside surface and two end portions;

the combustion exhaust gas conduction means (13) comprises an inlet to said chamber (15) supplying gas in a tangential direction for travel within said chamber in a circular and axial or spiral path;

the electrodes comprise an apertured cylinder (14) located within the chamber, and at least one electrostatic field spray disk (3) having said projecting points or teeth formed thereon located circumferentially on said cylinder, to build up an electrostatic field between the apertured cylinder (14) and the inside surface of the chamber (15);

said one of said outlet means (16) comprises a tubular duct extending within the apertured cylinder, and terminating within the longitudinal dimension thereof;

and the other outlet means (17) comprises at least one outlet duct (17) located adjacent at least one of the end portions of the chamber;

and the mechanical separator comprises the combination of the tangential location of said gas conduction means (13) and a shield or cover plate (18) spaced from said other outlet means and the inside surface of said chamber to permit conduction of flakes or agglomerates by gas to said other outlet means traveling in a spiral path around the inside surface of the chamber at which the flakes and agglomerates will precipitate, while permitting exhaust of gas from a position within said apertured cylinder through said one outlet means (16).

4,478,614

ELECTROSTATIC PRECIPITATOR CONSTRUCTION HAVING SPACERS

John A. Jonelis, 304 Lancaster Dr., Crystal Lake, Ill. 60014

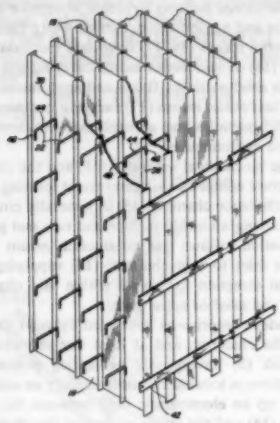
Filed Dec. 3, 1982, Ser. No. 446,775

Int. Cl.³ B03C *3/47*

U.S. Cl. 55—145 **8 Claims**

1. In an electrostatic precipitator for collecting solid particles carried by a flue gas from a source of combustion, said precipitator including a plurality of spaced parallel plates for collecting solid particles by electrostatic attraction of solid particles to the plates, each of said plates having a plurality of spatially arranged stiffeners projecting outwardly from opposite surfaces thereof, a plurality of elongated electrodes mounted between adjacent plates parallel to each other and parallel to the plates, the improvement comprising a plurality of spacers between adjacent plates to hold the plates in a flat attitude and maintain adjacent surfaces of the adjacent plates equidistantly spaced from one another, each of said spacers being elongated and having one end fixed to a surface of one of

a pair of said adjacent surfaces adjacent to a stiffener and the other end abutting the other of the pair of the adjacent surfaces, and each of the spacers being a single unitary intergral member.

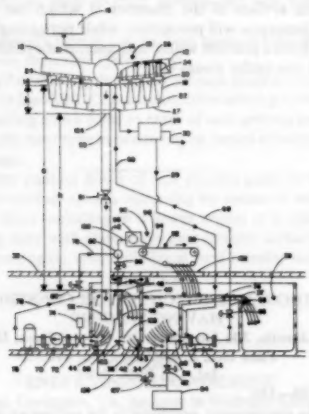


4,478,615

DEAERATED LIQUID STOCK SUPPLY

Robert G. Kaiser, Seminole, Fla., assignor to Clark & Vicario Corporation, Pinellas Park, Fla.

Continuation-in-part of Ser. No. 427,914, Sep. 29, 1982, Pat. No. 4,443,232. This application Sep. 6, 1983, Ser. No. 529,268
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—170 **41 Claims**



1. Apparatus for providing deaerated stock to a processing machine, said apparatus comprising:

(a) an enclosed receiver;

(b) means for maintaining said enclosed receiver under a vacuum;

(c) means for introducing stock into said enclosed receiver to thereby produce deaerated stock in said enclosed receiver at a predetermined average production rate;

(d) stock supply means for supplying stock to be deaerated to said introducing means;

(e) a receiver open to the atmosphere;

(f) a conduit for conducting deaerated stock from said enclosed receiver to said open receiver, said conduit having an inlet end connected to said enclosed receiver and an outlet end disposed within said open receiver;

(g) means for withdrawing stock from said open receiver at a net rate of withdrawal lower than said average production rate, so that stock accumulates as a pond in said open receiver, said withdrawing means being operative to transfer the withdrawn stock to the processing machine;

(h) pond level control means for discharging a recycle portion of stock from said open receiver and varying the rate of such discharge to maintain the pond of stock in said pen receiver at a predetermined pond level, the outlet end of said conduit being disposed at an elevation below said predetermined pond level;

(i) recycle means for passing the recycle stock discharged by said pond level control means to said introducing means;

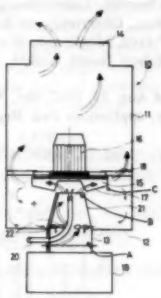
the outlet end of said conduit incorporating an open section disposed below said predetermined pond level for flow of stock from said conduit to said open receiver, the total area of said open section being greater than the mean interior cross sectional area of said conduit.

4,478,616

APPARATUS FOR REMOVING GASEOUS COMPONENTS AND/OR SOLID IMPURITIES FROM A GASEOUS FLUID FLOW

Viljo J. Järvenpää, Vellamontie 21, 04200 Kerava, Finland

Filed Aug. 19, 1982, Ser. No. 409,533
Int. Cl.³ B01D *47/16*
U.S. Cl. 55—223 **6 Claims**



1. Apparatus for removing gaseous components and/or solid impurities from a gaseous fluid flow, comprising:

a frame structure;

scrubber means disposed within said frame structure;

discharge means through which the purified gaseous fluid flow is discharged from said frame structure;

means for introducing scrubbing liquid into said apparatus and directing the scrubbing liquid into contact with said gaseous fluid flow;

fluid flow inlet means communicating with said frame structure through which said gaseous fluid flow is introduced into said frame structure towards said scrubber means, said fluid flow inlet means having a region through which the gaseous fluid flow rate is not accelerated and another region through which the flow rate is not accelerated and another region through which the flow rate of the gaseous fluid flow passing through said inlet means is increased prior to said scrubber means;

opening means situated in said inlet means through which a return flow of the scrubbing liquid passes to enter into said inlet means and pass therethrough in opposition to the direction of the gaseous fluid flow, said opening means disposed in said region of said inlet means where the flow rate of the gaseous fluid flow is not accelerated and shaped

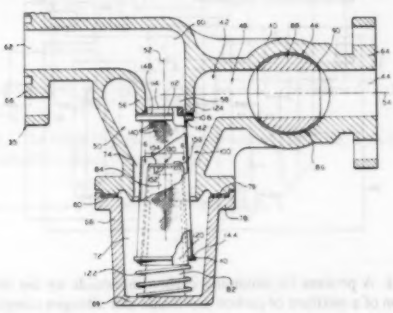
and disposed to direct the scrubbing liquid return flow in said inlet means in a direction opposite to the direction of gaseous fluid flow and so that the scrubbing liquid return flow is not entrained in the gaseous fluid flow.

4,478,617

STRAINER ARRANGEMENT FOR COMBINED DIRT COLLECTOR AND CUT OUT COCKS

James G. Rees, Chicago, Ill., assignor to William R. Page, Bristol, Wis., a part interest

Filed Sep. 30, 1982, Ser. No. 429,277
Int. Cl.³ B01D *50/00*; **F16D** *65/00*
U.S. Cl. 55—314 **10 Claims**



1. A combined dirt collector and cut out cock device for railroad cars adapted for incorporation in the car brake cylinder air supply system in the car branch pipe extending between the car brake pipe and the car air brake control valve, said cock device comprising:

a fitting body having a through passage formed therein including a valve chamber adjacent the brake pipe end of same,

off-on valve means operably mounted in said valve chamber for selectively closing and opening said passage,

said passage including a swirl chamber centered about and coaxial with an annular flange defining a throat communicating with the control valve end of said cock device,

said cock device including a foreign matter collection chamber below and aligned with said passage swirl chamber and defined by a bowl removably mounted on said body and defining an upstanding pedestal centered within same and coaxially aligned with said swirl chamber and said throat along an axis extending longitudinally and centrally of said pedestal,

a strainer device mounted in said cock device,

said strainer device comprising:

an inner shell received over said pedestal, with one end of said inner shell being disposed above said pedestal and the other end of said inner shell being disposed about said pedestal,

an outer shell received over said inner shell with one end of said outer shell projecting toward and substantially centered on said fitting body flange, and the other end of said outer shell being substantially centered on said inner shell and disposed adjacent to said other end of said inner shell,

an annular seal interposed between said outer shell one end and said flange,

and means for resiliently biasing said outer shell toward said flange to sealingly seat said seal against said flange,

said outer shell being open at said one end of same and being formed from a corrosion resistant foraminous material defining a multitude of mesh openings thereabout that are of micro-proportioning,

said mesh openings in total area exceeding the area of said throat by a factor of at least ten,

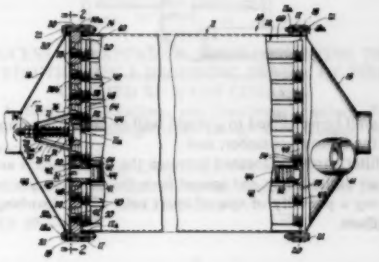
with said inner shell being fixed to said outer shell and being formed to pass only strained air therethrough.

4,478,618

DIESEL EXHAUST PARTICULATE TRAP WITH PLURAL FILTER TUBES

Kenneth B. Bly, Pontiac; Edward J. Chmiel, Warren, and Ernest T. Martyniuk, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1983, Ser. No. 519,028
Int. Cl.³ B01D *39/20*, *46/24*
U.S. Cl. 55—314 **2 Claims**



1. A particulate trap for removing particulates from the exhaust flow discharged from a diesel engine comprising a trap housing having an inlet connection and an outlet connection for the exhaust flow, an intermediate filter housing and, a support plate operatively positioned between one end of said filter housing and said outlet connection, said support plate having a central one way valve controlled bypass passage extending therethrough and a plurality of equally spaced apart internally threaded apertures therethrough located around said bypass passage; and, a plurality of filter tubes operatively supported within said filter housing by said support plate, each of said filter tubes comprising a perforated tube having an externally threaded outlet fitting fixed at one end thereof that is releasably threadingly engaged in an associate one of said internally threaded apertures in said support plate whereby each of said perforated tubes is supported in cantilever fashion from said support plate, a closure cap fixed at the opposite end of each of said tubes, each of said closure caps being of an external diameter relative to the spacing of said internally threaded apertures so that said closure caps will contact adjacent ones of said closure caps whereby said closure caps act as supports for the cantilever ends of said perforated tubes while still permitting axial expansion of said tubes and, a coating of ceramic fibers on said perforated tube extending between said outlet fitting and said closure cap, the outside diameter of said coating of ceramic fibers being less than the external diameter of each of said closure caps.

4,478,619

COMPRESSED AIR FILTERING APPARATUS

Andrew G. Arends, 202 E. State St., Ontario, Calif. 91761, and Gary W. Arends, 9999 Foothill - Space 163, Rancho Cucamonga, Calif. 91701

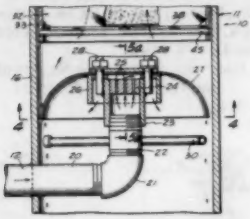
Filed May 2, 1983, Ser. No. 490,335
Int. Cl.³ B01D *50/00*, *27/02*
U.S. Cl. 55—316 **4 Claims**

1. Apparatus for removing water, liquids and particulate matter from pressurized air, comprising, in combination:

a housing including an internal chamber, an air inlet fitting, an air outlet fitting and a liquid drainage fitting;

means interconnected with the inlet fitting for receiving the pressurized air and passing the same through one or more orifices into the housing chamber, said means including a pipe section with a plug therein and said plug having at least one orifice;

shield means positioned within the chamber for intercepting air from the orifices and directing it downwardly in said housing chamber, said means including a cylindrical wall having one end open within which the pipe section is received and the other end pipe section of said cylindrical



wall being affixed to a shield wall sloping downwardly in the housing chamber; and

a filter cartridge located between the shield means and the air outlet fitting and spaced from the shield means including a plurality of spaced apart cells of an absorbing medium.

4,478,620

AIR FILTER

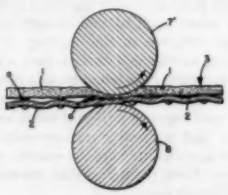
Tadashi Tamura, Shiga, Japan, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 446,979

Claims priority, application Japan, Dec. 21, 1981, 56-206647

Int. Cl.³ B01D *39/00*

U.S. Cl. 55—486 **6 Claims**



1. An air filter comprising:

a non-woven fabric of fibers having an area to weight relationship of less than about 200 g per sq m and being constructed so as to produce an air pressure loss across its thickness of less than about 3.0 mmWater when measured at an air speed of 2 m per sec;

a net of synthetic resin strands overlapping and coterminus with the fabric, the net having convex shaped portions of said synthetic resin substantially uniformly distributed along the strands which are raised at least approximately 0.3 mm above the strand surfaces and are directed toward the non-woven fabric;wherein

the fabric and net are bonded together by thermal integration of the convex shaped portions of the net and the corresponding overlapping portions of fabric fibers into a matrix arrangement, and wherein unraised portions of said strands are not substantially bonded to said fibers.

4,478,621

PROCESS FOR THE EXTRACTION OF CARBON MONOXIDE FROM GAS STREAMS

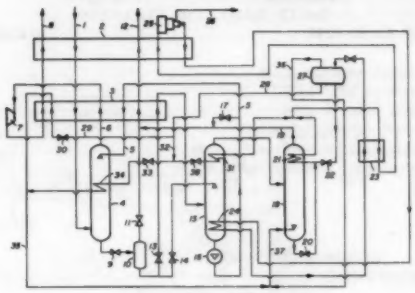
Rainer Fabian, Geretsried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,402

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215829

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—31 **15 Claims**



1. A process for obtaining carbon monoxide by the distillation of a mixiture of carbon monoxide and nitrogen comprising supplying said mixture of carbon monoxide and nitrogen to a distillation column, distilling said mixture of carbon monoxide and nitrogen in said distillation column so as to produce a sump product comprising a first substantially pure stream of liquid carbon monoxide and a head product comprising a distillation gas stream containing said nitrogen therein, heating the sump in the lower portion of said distillation column by contacting said sump with a second carbon monoxide stream, withdrawing said sump product from said distillation column, expanding said sump product withdrawn from said distillation column so as to reduce the temperature thereof, cooling said distillation gas stream in the upper portion of said distillation column by contacting said distillation gas stream with at least a portion of said expanded sump product, recycling at least a portion of said sump product so as to provide said second carbon monoxide stream, and withdrawing at least a portion of said sump as a substantially pure carbon monoxide product stream.

4,478,622

METHOD OF MAKING MULTICOMPONENT OPTICAL WAVEGUIDE HAVING INDEX GRADIENT

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 883,214, Mar. 3, 1978, abandoned. This application Mar. 13, 1980, Ser. No. 130,079

Int. Cl.³ C03C *25/02*

U.S. Cl. 65—3.12 **2 Claims**

1. The method of making a gradient index optical waveguide comprising:

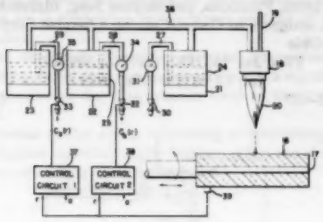
forming a core having a radius a from at least three glass-forming compounds;

varying the concentrations of said compounds while forming so that the refractive index is n_c at the center of said core and varies as a function of the radial distance r from the center of said core substantially as:

$$n_2(r) = n_c^2\left[1 - \sum_{i=1}^{N} 2\Delta_i (r/a)^{\alpha_i}\right]$$

where N is the number of α-type profile terms, Δ_i and α_i are different values which produce minimum pulse disper-

sion in said waveguide and are related to the properties of said glass forming compounds such that



$$a_i = 2 - \frac{2n_c}{N_c}\,\frac{\lambda}{\Delta_i}\,\frac{d\Delta_i}{d\lambda} - \frac{12}{5}\,\Delta\; i = 1 \ldots N \text{ where } N \geq 2,$$

n_c is the refractive index at the center of said core, n_O is the refractive index at $r=a$;

$$N_c = n_c - \lambda dn_c/d\lambda$$

and

$$= \sum_{i=1}^{N} \Delta_i = (n_c^2 - n_0^2)/2n_c^2$$

applying a layer of cladding material surrounding said core, the refractive index of said layer being less than the refractive index of said core;

heating said core and cladding to the drawing temperature thereof; and

drawing said core and cladding into an optical waveguide.

4,478,623

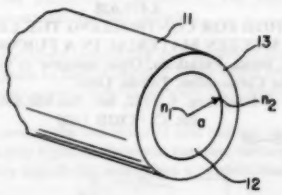
METHOD OF MAKING OPTIMAL INDEX PROFILE FOR MULTICOMPONENT NONLINEAR GLASS OPTICAL WAVEGUIDE

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 183, Jan. 2, 1979, abandoned. This application Jul. 23, 1980, Ser. No. 171,656

Int. Cl.³ C03C *25/02*

U.S. Cl. 65—3.12 **6 Claims**



1. A method of making a gradient index optical waveguide comprising:

forming a core having a radius a from silicate compounds formed at least two dopants the concentrations of which do not have a linear relationship with the square of the index of refraction of said core;

varying the concentrations of said compounds while forming so that the refractive index of said core is n_1 at the radius $r=0$ and n_2 at the radius $r=a$, the concentrations of each compound varying as a function of the radial distance from the center of said core substantially as:

$$C_i(r) = C_i^{\rho} + [(1-\xi_i)(r/a)^{\alpha} + \xi_i(r/a)^{2\alpha}]C_i^{1}$$

where $C_i(r)$ denotes the concentration of the i^{th} dopant as a function of radial distance, C_i^{ρ} denotes the concentration at $r=0$ of the i^{th} dopant, C_i^{1} denotes the difference in concentration of the i^{th} dopant between $r=a$ and $r=o$, α is the selected index profile, ξ_i are finite, non-zero, variable parameters relating the concentration of the i^{th} dopant to radial distance r, said parameters minimizing the factor $\delta(\lambda)$ by which the index of refraction profile differs from the profile produced where there is a linear relationship between the square of the index of refraction and said concentrations.

4,478,624

PROCESS AND APPARATUS FOR IMPROVING THE DISTRIBUTION ON A RECEIVING DEVICE OF FIBERS CARRIED BY A GAS CURRENT

Jean A. Battigelli, Rantigny, and Dominique Plantard, Paris, both of France, assignors to Isover Saint-Gobain, Paris, France

Filed Aug. 2, 1982, Ser. No. 404,328

Claims priority, application France, Aug. 6, 1981, 81 15282

Int. Cl.³ C03B *37/06*

U.S. Cl. 65—4.4 **14 Claims**

1. A process for producing mineral fiber mats on a perforated fiber-collecting surface, comprising attenuating streams of molten mineral material in an attenuating zone in a gas current, directing said current with the attenuated fibers toward the fiber-collecting surface, and developing a layer of gas surrounding and adjoining the periphery of the fiber-carrying current and directing said layer into contact with the gas current, the contact being effected in spaced relation downstream of said attenuating zone, the general direction of flow of the gas of said layer being toward the collecting surface and at any peripheral position around the current being at an oblique angle to the adjoining portion of the fiber-carrying gas current.

4,478,625

APPARATUS FOR PRODUCING AND COLLECTING GLASS FIBERS

Lawrence J. Grubka, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 20, 1982, Ser. No. 450,818

Int. Cl.³ C03B *37/12*

U.S. Cl. 65—11.1 **6 Claims**

1. Apparatus for producing and collecting continuous glass filaments comprising:

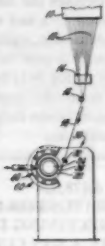
feeder means for supplying a plurality of streams of molten glass to be drawn into filaments;

means for applying a coating to said filaments;

a rotatable member adapted to wind said filaments in layers therearound and to draw said streams into said filaments;

a plurality of spaced apart fingers having an orifice therein to direct a body of gas as a plurality of streams to at least partially dry the coated filaments wound around said member, said gas being directed into contact with the layers along the length thereof and over a portion of the arcuate periphery of the layers; and

collection means for removing the vapor containing air from around the periphery of said layers of filaments, said collection means being comprised of a housing having an arcuate, foraminous inner surface positioned adjacent said



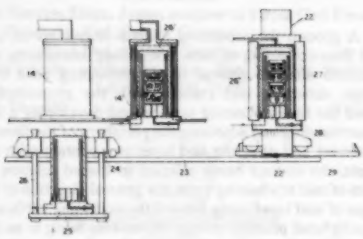
fingers, the orifices of said fingers being located between said layers and said foraminous surface, said foraminous surface extending along the length of said layers and over a portion of the arcuate periphery of the layers.

4,478,626

METHOD OF HOT ISOSTATIC PRESSING TREATMENT

Masato Moritoki, Miki; Takao Fujikawa, and Junichi Miyanaga, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 1, 1982, Ser. No. 413,839
Claims priority, application Japan, Sep. 1, 1981, 56-138013
Int. Cl.[3] C03B *19/06, 19/09*
U.S. Cl. 65—18.1 15 Claims



1. A method of hot isostatic pressing in which a shaped item to be worked immersed in molten glass in subjected to a hot isostatic pressing treatment, said method comprising:

embedding said shaped item to be worked in glass powder disposed in a crucible;

loading said crucible into a movable heating furnace having a heater and a heat insulating structure;

charging said furnace into an atmospheric chamber;

adjusting the atmosphere in said chamber to a predetermined condition and heating said crucible by said heater to soften and melt said glass in said crucible;

transferring said furnace from said atmospheric chamber into a high pressure container while maintaining a high temperature in said furnace;

admitting a pressurizing gas medium into said high pressure container while raising the temperature of said furnace such that said item to be worked on in said crucible undergoes a hot isostatic pressing treatment; and

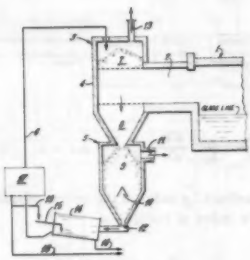
upon completion of said hot isostatic treatment, removing said furnace from said high pressure container with said item to be worked being maintained in a loaded state.

4,478,627

RECUPERATION OF HEAT ABSORBENT MEDIA TO PREHEAT COMBUSTION GASES AND GLASS BATCH

Charles M. Hohman, Granville; Mark A. Propster, Gahanna; Charles Dunn, Pataskala, and Stephen Seng, Bladensburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 16, 1982, Ser. No. 399,085
Int. Cl.[3] C03B *1/00, 3/00*
U.S. Cl. 65—27 7 Claims



1. A method of recovering waste heat from a furnace which comprises:

(a) passing hot flue gases into contact with heat absorbent media to heat said media and cool said hot flue gases, and passing said cooled flue gases to outlet conduit;

(b) passing said heated media into contact with gases for combustion to heat said gases for combustion and partially to cool said heated media, and passing said heated gases for combustion into firing system of said furnace;

(c) passing said partially cooled media into contact with cold glass batch to heat said cold glass batch and to cool further said partially cooled media, and passing said heated glass batch into said furnace;

(d) passing said further cooled media through separation means to clean said further cooled media by removing adhering particles of said glass batch and furnace condensate from said further cooled media;

(e) passing said cleaned further cooled media into position to contact said hot flue gases; and

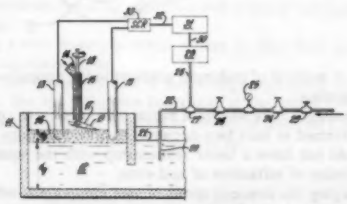
(f) passing said removed particles of glass batch and furnace condensate into either said furnace or into said cold glass batch.

4,478,628

METHOD FOR CONTROLLING THE LEVEL OF MOLTEN MATERIAL IN A FURNACE

Charles S. Dunn, Pataskala, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 5, 1982, Ser. No. 405,658
Int. Cl.[3] C03B *3/00*
U.S. Cl. 65—29 3 Claims



1. A process for controlling the level of molten material in a melting furnace containing a body of molten material with a

blanket of unmelted batch material on the surface thereof including the steps of:

continuously choke feeding batch material to the furnace at or near the upper surface of the batch blanket at all times so that a continuous stream of batch material essentially rests or is supported at the upper surface of the batch blanket,

sensing the level of molten material downstream of the melting furnace, said sensing producing a signal which is responsive to the downstream level of molten material, and

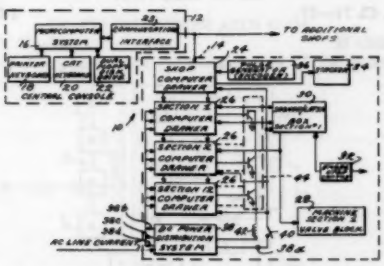
in response to the signal, increasing or decreasing the level of molten material in the furnace when the downstream level of molten material changes.

4,478,629

POWER FAILURE DETECTION SYSTEM FOR A GLASSWARE FORMING MACHINE

Charles L. Wood; Glenn H. Mapes, both of Muncie, Ind., and Stephen W. Daudt, Longmont, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Jul. 8, 1981, Ser. No. 281,500
Int. Cl.³ C03B 5/38
U.S. Cl. 65—163 **55 Claims**



1. In an electronic controller for a glassware forming machine, said machine being periodically receptive of molten glass and including a plurality of separately movable elements, said controller selectively effecting movement of said elements in timed relation to form rigid glassware from said molten glass, said controller including a primary power supply to develop electrical power signals of a predetermined voltage for said controller, said controller further including means, responsive to stop signals applied thereto, for halting the operation of said machine in a manner such that removal of molten glass from said elements is facilitated; the improvement wherein said controller further includes:

a battery;

means for selectively connecting said battery to provide said power signals to said controller in the event that the primary power supply fails to provide such power signals; and

means for sensing the condition of said battery and for generating a stop signal in the event that said battery provides said power signals for more than a predetermined length of time.

6. In a glassware forming machine having at least one section of the type selectively receptive of molten glass and including a plurality of respective separately movable elements, said machine including control means for controllably effecting movement of said elements in timed relation to form rigid glassware from molten glass, said control means including electronic components responsive to power signals of predetermined voltage from a primary power supply;

programmed stop means, responsive to a programmed stop signal, for stopping receipt of said molten glass and effecting a predetermined programmed stop sequence of element movements, whereby operation of the section is stopped only after all previously received molten glass has been cleared from the section;

an emergency stop means, responsive to an emergency stop signal, for effecting an immediate hal: to element movement in the section and for placing said elements in a condition to facilitate clearing of said molten glass from said elements;

the improvement wherein said control means further includes:

an auxiliary power source for selectively providing said power signal when said primary power supply fails to provide said power signal;

means, cooperating with said auxiliary power source, for sensing provision of said power signal by said auxiliary power source and for generating a selected one of said programmed stop signal and emergency stop signal, if said auxiliary power source provides said power signal for more than a predetermined time period.

24. In an electronic controller for a glassware forming machine, said machine including at least one unit periodically receptive of molten glass, said unit comprising a plurality of separately movable elements, a controller for selectively generating signals to effect a machine cycle comprising operation of said elements in timed cyclical relation in synchronism with said reception of molten glass to form rigid glassware from said molten glass, said controller being receptive of machine cycle signals indicative of advancement in said machine cycle,

said controller further including stop means, responsive to a stop signal, for halting said timed sequence of element operation;

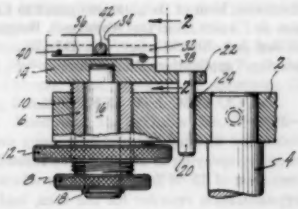
the improvement wherein said controller includes machine cycle monitoring means, responsive to said machine cycle signals, for generating said stop signal if the machine cycle speed drops below a predetermined threshold.

4,478,630

BOTTOM PLATE RETAINER

Scott M. Lambert, Enfield, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 4, 1983, Ser. No. 472,299
Int. Cl.³ C03B 9/00
U.S. Cl. 65—242 **7 Claims**



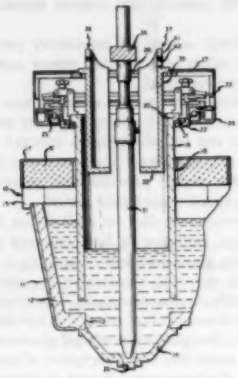
4. A bottom plate assembly of a glassware forming machine including at least one retainer comprising an elongated mounting block having grooves in its side portion in the direction of elongation, a first slot in said mounting block opening from the top and extending parallel to said grooves, a second slot extending transversely to said first slot, a leaf spring mounted in said first slot, a dowel member positioned in said second slot and attached to said leaf spring, said bottom plate being mounted on said retainer and including tapering tongue portions engaged in said grooves in said mounting block, a cross slot through said tapering tongue positions of lesser width than the diameter of said dowel member, said leaf spring urging said dowel member against said tapering tongues and partially into said cross slot.

4,478,631

GLASS FEEDER HEAT BAFFLE

Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 6, 1983, Ser. No. 482,676
Int. Cl.³ C03B 7/08
U.S. Cl. 65—327 6 Claims



1. An improved glass feeder including a feeder bowl having a cylindrical tube extending vertically downward into the feeder bowl with means to support the tube for rotation about its vertical axis, a row of plungers extending vertically downward into the feeder bowl and positioned inside said tube for controlling the flow of glass from orifices in the bottom of the bowl, the improvement therein including a pair of heat baffles extending downward into the tube at either side of the row of plungers and occupying a sufficient portion of the space therebetween, to act as a barrier against the movement of heat up through the space between the tube and plungers.

4,478,632

PROCESS FOR MAKING GRANULES CONTAINING UREA AS THE MAIN COMPONENT

Willy H. P. Van Hijfte, Assenede, and Luc A. Vanmarcke, Kaprijke-Lembeke, both of Belgium, assignors to Compagnie Neerlandaise de l'Azote (Soci'ete' Anonyme), Belgium

Filed Jun. 30, 1982, Ser. No. 393,656
Claims priority, application Netherlands, Jul. 3, 1981, 8103205
Int. Cl.³ C05G 3/00; C05C 9/00
U.S. Cl. 71—29 2 Claims

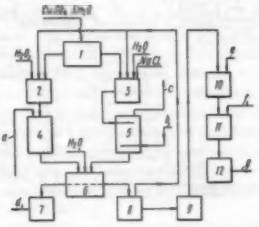
1. In a process for making granules containing urea as the main component by spraying as aqueous urea solution having a urea concentration of 85–98% by weight, to which solution is added a crystallization retarder for the urea, said solution optionally other fertilizers including ammonium sulphate, ammonium dihydrogen phophate, and diammonium hydrogen phosphate, in solution or suspension, in the form of fine droplets having an average diameter between 20 and 120 microns, into a fluidized bed of urea particles at a temperature at which the water from the solution or suspension sprayed onto the particles is evaporated and the urea or fertilizer material containing urea as the main component solidifies on the particles to form granules having a desired size, the improvement comprising using as the crystallization retarder a member selected from the group consisting of magnesium hydroxide, an inorganic magnesium salt or a mixture thereof, wherein said magnesium hydroxide, inorganic salt or mixture thereof is added to the solution or suspension in an amount equivalent to at least 0.1 to about 1.0% by weight of MgO calculated on the urea in said solution or suspension.

4,478,633

METHOD FOR PROCESSING WASTES RESULTING FROM PRODUCTION OF PHOSPHORUS, NAMELY, SLIME AND OFF-GASSES, WITH UTILIZATION OF THE RESULTANT PRODUCTS

Vasily B. Chernogorenko, ulitsa Ezhena Potie, 11 kv. 86, Kiev; Tleubai M. Alzhanov, Poltoratskaya, 18a, kv. 4, Chimkent; Kima A. Lynchak, ulitsa Kaunasskaya, 4, kv. 55; Simon V. Muchnik, Yaroslavov val, 17, kv. 12, both of Kiev; Evgeny S. Ishkhanov, ulitsa Dzhangildina, 8, kv. 22; Vladimir Y. Sergienko, ulitsa Cagarina, 84, both of Chimkent; Vladimir G. Sapian, ulitsa Dekabristov, 37, kv. 30, Vasilkov Kievskoi oblasti; Vladimir M. Koverya, ulitsa Bocharova, 8b, kv. 114, Zaporozhie; Mendel E. Pobortsev, ulitsa Vedopyanova, 7, kv. 1, Chimkent; Evgeny A. Markovsky, ulitsa Sewashko, 21, kv. 58, Kiev; Valentina V. Dmitrenko, ulitsa 40 let Sovetskoi Ukrainy, 2, kv. 180, Zaporozhie; Vladimir I. Bykov, ulitsa Zaitseva, 22, kv. 83, Leningrad; Alexandr D. Kipchakvaev, ulitsa Uritskogo, 186, kv. 33, and Alexandr N. Vopilov, ulitsa Uritskogo, 210, kv. 34, both of Chimkent, all of U.S.S.R.

Division of Ser. No. 275,855, Jun. 22, 1981, Pat. No. 4,357,161, which is a division of Ser. No. 109,297, Jan. 3, 1980, Pat. No. 4,302,249, which is a division of Ser. No. 898,973, Apr. 21, 1978, Pat. No. 4,192,853. This application Jun. 15, 1982, Ser. No. 389,271
Int. Cl.³ C05B 11/04
U.S. Cl. 71—37 1 Claim



1. A method for utilization of a liquid product containing phosphoric acid, sulphuric acid and copper sulphate prepared from the slime and off-gases of the production of phosphorous by the treatment thereof with an aqueous solution of cuprous sulphate of 30–50% concentration in the case of treatment of slime and 15–20% concentration in the case of treatment of off-gases, followed by separation of the resulting solid product containing mainly copper phosphide, chlorides and fluorides of alkali metals and silicon and silicate of calcium and aluminium from the liquid product containing sulphuric acid, phosphoric acid and copper sulphate, which comprises mixing said liquid product with Cottrell dust containing P_2O_5, K_2O and phosphorus fines and phosphorite flour, thereby obtaining a copper-containing potassium phosphorus fertilizer.

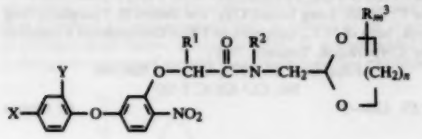
4,478,634

HETEROCYCLIC AMIDES OF PHENOXYPHENOXYALKANOIC ACIDS

Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 376,097, May 7, 1982, Pat. No. 4,402,729. This application Jul. 1, 1983, Ser. No. 510,008
Int. Cl.³ A01N 43/00; C07D 317/10
U.S. Cl. 71—88 3 Claims

1. A compound of the formula:



wherein X is halogen or trifluoromethyl; Y is selected from the group consisting of hydrogen, halogen, nitro and cyano; R^1 is alkyl; R^2 is selected from the group consisting of hydrogen, alkyl, alkenyl and alkynyl; and R^3 is selected from the group consisting of alkyl and halogen; m is an integer from 0 to 3; and n is the integer 1.

4,478,635

N-ARYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen; Karl Gass, Magden; Werner Töpfl, Dornach; Rolf Schurter, Binningen, all of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

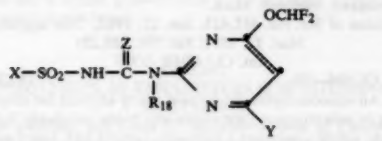
Filed Jan. 3, 1983, Ser. No. 455,175

Claims priority, application Switzerland, Jan. 11, 1982, 124/82

Int. Cl.³ C07D *239/69;* A01N *43/54*

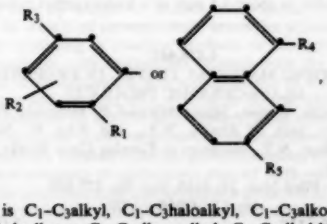
U.S. Cl. 71—92 **25 Claims**

1. An N-arylsulfonyl-N'-pyrimidinyl urea of the general formula I



wherein

X is a radical of the formula



Y is C_1–C_3alkyl, C_1–C_3haloalkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, C_2–C_3alkoxyalkyl, C_1–C_3alkylthio, halogen or $—NR_{16}R_{17}$,

Z is oxygen or sulfur,

R_1 is hydrogen, halogen, cyano, nitro, C_1–C_4haloalkyl, C_1–C_4alkyl, C_1–C_4alkoxy, —CO—R_6, $—NR_7R_8$, —S(O)$_m$—C_1–C_4alkyl or $—SO_2R_9$,

R_2 is hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl, $—NR_{20}R_{21}$, methyl, ethyl, methoxy, ethoxy or —S(O)$_m$Z—C_1–C_4alkyl,

R_3 is hydrogen, fluorine, chlorine, bromine, amino, nitro or methoxy,

R_6 is hydrogen, C_1–C_4alkyl, C_3–C_5alkenyloxy, C_3–C_5alkynyloxy, C_1–C_4haloalkyl, C_1–C_5alkylthio, phenoxy, benzyloxy, $—NR_{10}R_{11}$ or C_1–C_5alkoxy which is unsubstituted or substituted by 1 to 3 halogen atoms or C_1–C_3alkoxy,

R_7 is hydrogen, methoxy, ethoxy, C_1–C_4alkyl or —CO—R_{12},

R_8 is hydrogen or C_1–C_4alkyl,

R_9 is an —O—R_{13} or $—NR_{14}R_{15}$ group,

R_{13} is C_1–C_4alkyl which is unsubstituted or substituted by 1 to 3 halogen atoms, or is phenyl or benzyl,

R_{18} is hydrogen, C_1–C_3alkyl or C_1–C_3alkoxy, and

m is 0, 1 or 2,

and R_4 has the same meaning as R_2; R_5 has the same meaning as R_1; R_{10}, R_{11}, R_{14} and R_{20} have each the same meaning as R_7; and R_{12}, R_{15}, R_{16}, R_{17} and R_{21} have each the same meaning as R_8, or a salt thereof.

4,478,636

HERBICIDAL COMPOSITIONS OF EXTENDED SOIL LIFE

Daniel L. Hyzak, Austin, Tex., assignor to Stauffer Chemical Company, Westport, Conn.

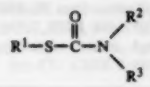
Continuation-in-part of Ser. No. 383,649, Jun. 1, 1982, abandoned, which is a continuation of Ser. No. 255,516, Apr. 20, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 472,456

Int. Cl.³ A01N *25/22*

U.S. Cl. 71—100 **9 Claims**

1. An herbicidal composition of extended soil life comprising

(a) an herbicidally effective amount of a thiocarbamate having the formula



in which R^1, R^2, and R^3 are independently C_2–C_4 alkyl; and

(b) an amount of an N-methyl thiocarbamylethyl-N'-methylcarbamate sufficient to extend the soil life of said thiocarbamate, said thiocarbamylethylcarbamate having the formula

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4,478,637

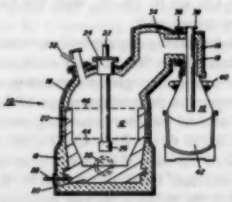
THERMAL REDUCTION PROCESS FOR PRODUCTION OF MAGNESIUM

Roy A. Christini, Colville, Wash.; Rolf Rolles, New Kensington; Kenneth A. Bowman, Leechburg, both of Pa., and Marlyn D. Ballain, Colville, Wash., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 10, 1983, Ser. No. 474,743

Int. Cl.³ C22B *26/20*

U.S. Cl. 75—67 R **32 Claims**



1. A process for the recovery of magnesium having low silicon contamination from magnesium oxide containing ore by

reduction of said oxide utilizing a mixture of reducing agents, the process occurring in a system having a reaction zone and a condensation zone, the process comprising the steps of:

(a) contacting a slag in said reaction zone at a temperature between 1300° and 1700° C. and at a pressure below 250 torr with the reducing mixture containing ferrosilicon and at least 25 wt. % aluminum, the reducing agent contacting the slag to produce magnesium vapor, a portion of said ferrosilicon and aluminum being oxidized;

(b) maintaining the composition of the slag to contain from 1 to 8 wt. % MgO, at least 9 wt. % Al_2O_3 and have a CaO/SiO_2 weight ratio no less than that defined by the formula $2.1+0.03$ (wt. % Al_2O_3-9), said slag further having the ability to decrepitate upon cooling; and

(c) removing the magnesium vapor from the reaction zone to the condensation zone for purposes of condensing the magnesium.

4,478,638

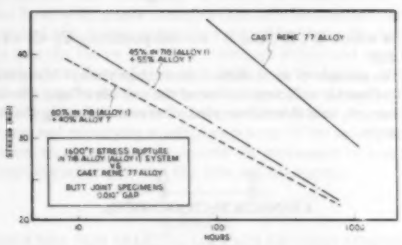
HOMOGENOUS ALLOY POWDER

Murray S. Smith, Jr., Cincinnati; Roger J. Perkins, Evendale; Robert E. Fryxell, and William R. Young, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 383,077, May 28, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,233

Int. Cl.³ B23P *6/04*; B23K *1/04*; B22F *7/02*

U.S. Cl. 75—255 **3 Claims**


CAST RENE' 77 ALLOY
65% IN 718 (ALLOY I) + 35% ALLOY Y
60% IN 718 (ALLOY I) + 40% ALLOY Y
ISOOT STRESS RUPTURE IN THE ALLOY (ALLOY I) SYSTEM VS CAST RENE' 77 ALLOY BUTT JOINT SPECIMENS 0.010" GAP
STRESS (KSI)
HOURS

1. A mixture of a Ni base superalloy first powder and a Ni base superalloy second powder, the combination defining a homogenous powder system;

the first powder characterized by superior hot corrosion resistance along with good oxidation resistance and mechanical properties, and the substantial absence of melting point depressant elements selected from the group consisting of Si and B in amounts greater than 1 wt % Si and 0.05 wt % B;

the first powder consisting essentially of, by weight, 0.01–0.2% C, 16–23% Cr, 2–10% Mo, 15–21% Fe, up to 6% of the sum of Cb and Ta, up to 2% Ti, less than 2% Al, less than 3% Co, up to 2% W, with the balance Ni and incidental impurities; and

the second powder having a composition which includes all of the elements of the first powder each, except for elements selected from the group consisting of Si and B, within the respective percentage range of that of the first powder, the second powder consisting essentially of, by weight, 0.01–0.2% C, 16–23% Cr, 2–10% Mo, 15–21% Fe, up to 6% of the sum of Cb and Ta, up to 2% Ti, less than 2% Al, less than 3% Co, up to 2% W, 0.5 ∝ 5% B, up to 6% Si, with the balance Ni and incidental impurities, and having a melting temperature lower than that of the first powder;

the mixture consisting essentially of, by weight, 30–70% of the firt powder and 30–70% of the second powder.

4,478,639

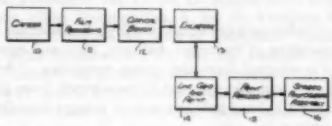
METHOD FOR STEREOSCOPIC PHOTOGRAPHY

Edgar C. Smith, Long Island City, and James B. Campbell, New York, both of N.Y., assignors to Three Dimensional Photography Corporation, Yonkers, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,748

Int. Cl.² G03C *9/00*

U.S. Cl. 430—9 **62 Claims**



1. A method for processing a plurality of film frames in excess of two for use in sterogram each frame having an image of the same subject, comprising the steps of

establishing a stereo base by measuring the center to center distance between identical points in a selected pair of the film frame images, and

marking each film frame or image with a mark according to the stereo base by dividing the stereo base by the number of the plurality of film frame images minus one in order to determine the location of the mark.

4,478,640

WELL TREATING PROCESS AND COMPOSITION

Ann C. Holland, Casper, Wyo., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 461,423, Jan. 27, 1983,. This application Mar. 12, 1984, Ser. No. 588,251

Int. Cl.³ C04B *7/353*

U.S. Cl. 106—76 **18 Claims**

1. An aqueous hydraulic cement slurry adapted for emplacement in subterranean formations and being relatively light in weight which comprises a hydraulic cement and, based on 100 parts by weight of said cement:

A. about 150 to about 250 parts water;

B. about 10 to about 15 parts sodium bentonite;

C. about 0.5 to about 1.5 part sodium metasilicate;

D. about 0.5 to about 1.5 part of a hydroxyethyl cellulose.

4,478,641

EMBEDDING MATERIAL USEFUL IN PREPARING GLASS-CERAMIC PRODUCTS

Peter J. Adair, Boston, Mass.; Michael P. Hobczuk; Paul I. Kingsbury, both of Elmira, N.Y., and John W. Nelson, Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,168

Int. Cl.³ C04B *11/00*

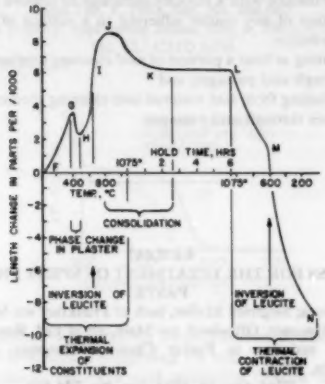
U.S. Cl. 106—110 **2 Claims**

1. An embedment material for use with glass castings which are subsequently heat treated to convert the glass into a glass-ceramic, said glass casting consisting essentially, expressed in terms of weight percent on the oxide basis, of

K_2O	10–18	Al_2O_3	0–2
MgO	14–19	ZrO_2	0–7
SiO_2	55–65	F	4–9

and said glass-ceramic exhibiting a coefficient of thermal expansion of about $70–90\times10^{-7}$/°C., said embedment material, expressed in terms of weight percent, consisting essentially of 5–30% plaster of Paris and 70–95% leucite, or consisting essentially of 45–60% Al_2O_3, 25–35% cristobalite, 5–20% plaster of Paris, and 0–15% leucite, which material displays resistance to thermal deformation at a temperature between about

1050°–1150° C., demonstrates a coefficient of thermal expansion equal to or not more than 40×10^{-7}/°C. units greater than that exhibited by said glass-ceramic, is subject to an inversion at a temperature below about 775°–825° C. accompanied with a change in volume of greater magnitude than that exhibited by



said glass casting resulting from the thermal expansion thereof, and is inert to said glass and glass-ceramic, whereby the shrinkage customarily experienced during the densification of said casting as the glass is converted into a glass-ceramic is minimized and a sound glass-ceramic article of tight dimensional tolerances is produced.

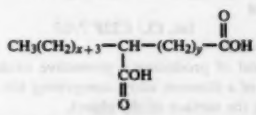
4,478,642

AMPHOTERICS AS EMULSIFIERS FOR BITUMINOUS EMULSIONS

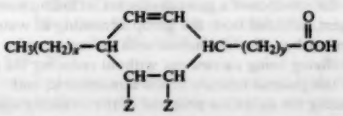
Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,714
Int. Cl.³ C08L 95/00
U.S. Cl. 106—277 **29 Claims**

1. A bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an amphoteric emulsifier selected from the group consisting of reaction products of nitrogen-containing intermediates with compounds selected from the group consisting of formaldehyde and sodium sulfite or bisulfite, chloroalkane sulfonic acid salts, γ-propane sultone, chloromethane phosphonic acid, acrylic acid, fumaric acid, maleic acid and chloroalkanoic acids, wherein the nitrogen-containing intermediates are selected from the group consisting of amphoteric reaction products of polyamines reacted with sulfonated carboxylic acids and amphoteric reaction products of polyamines reacted with polycarboxylic acids corresponding to the formulae



and



wherein x and y are integers from 3 to 9, x and y together equal 12, at least one Z is a carboxylic acid group and any remaining Z is hydrogen, and water to make up 100% by weight, the emulsion having a pH in the range of from 2 to 12.

4,478,643

BASE COMPOSITION COMPRISING AN IRRADIATED ORGANIC PIGMENT

Toshide Kuwahara, Habikino; Mituo Kiboku, Kamo; Seisiro Ito, Ikoma; Tatuhiko Ihara, Kure, and Shoji Ikeda, Hirakata, all of Japan, assignors to Gakko Hojin Kinki Daigaku and Nippon Paint Co., Ltd., both of Osaka, Japan

Filed Jun. 9, 1983, Ser. No. 502,686
Claims priority, application Japan, Jun. 11, 1982, 57-101025
Int. Cl.³ C09D 7/14
U.S. Cl. 106—288 Q **10 Claims**

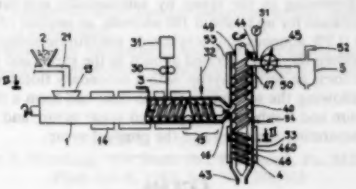
1. A pigment-containing base composition comprising at least one organic pigment irradiated with low-temperature plasma and at least one polar solid or liquid vehicle, said pigment having been irradiated with said plasma before adding said vehicle.

4,478,644

PROCESS AND APPARATUS FOR HYDROLYZING CELLULOSE MATERIAL

Pierre Berger, Saint-Etienne, and Maurice Gelus, Le Creusot, both of France, assignors to Creusot-Loire, Paris, France

Filed Apr. 15, 1983, Ser. No. 486,163
Claims priority, application France, Apr. 15, 1982, 82 06473
Int. Cl.³ C13K 1/00
U.S. Cl. 127—1 **14 Claims**



1. Process for hydrolysing cellulose material by passing the latter into an hydrolysis extruder comprising at least two parallel screws rotated within a sleeve in which the material introduced in the moist condition and transported by the screws between an inlet orifice and an outlet orifice placed at the two ends, respectively upstream and downstream of the sleeve, is malaxated and heated until it reaches a temperature above 200° C. in the downstream part of the hydrolysis extruder where it is contacted with an acid solution, and progressively compressed, the outlet orifice being provided with a control device for the evacuation of the hydrolysed material and which can maintain at the outlet of the hydrolysis extruder a pressure higher than the saturated vapour pressure of the liquid phase of the hydrolysed material at the temperature reached in the downstream part, said process comprising effecting in the control device for evacuating the material, a separation of the liquid phase and of the solid phase of the hydrolysed material with maintenance of the outlet pressure, by using for this purpose an output extruder comprising two screws whose axes are perpendicular to that of the hydrolysis extruder and rotated within a sleeve into the central part of which the hydrolysed material coming from the hydrolysis extruder discharges and in which a pressure is maintained higher than the saturated vapour pressure of the liquid phase by regulating the extrusion characteristics to form, at the downstream end of the output extruder, a plug of compressed material fluid-tight at said pressure, the latter being regulated by means of a pressure reducing valve controlling the removal of the concentrated liquid phase in the upstream part of the output extruder and in which the glucose formed by hydrolysis is dissolved.

4,478,645
PROCESS FOR THE PURIFICATION OF SUGAR SYRUPS

Geir V. Gudnason, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 305,307, Sep. 24, 1981, Pat. No. 4,382,823. This application Apr. 21, 1983, Ser. No. 470,118

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.³ C13D *3/00, 3/02*

U.S. Cl. 127—57 **19 Claims**

1. A process for purifying sugar syrup, which comprises:

(a) combining an impure sugar syrup of about 50° to about 65° Brix with a flocculating agent selected from lime in combination with a phosphate ion source, or lime in combination with aluminum sulfate, to form a primary floc in the syrup, wherein the amount of agent added forms an amount of primary floc sufficient to remove a substantial quantity of impurities from the syrup and adjusts the pH of the syrup to about 6 to 8, and wherein the syrup is maintained at a temperature of from a temperature sufficient for floc formation up to about 90° C.;

(b) removing an aliquot from the syrup before or after the syrup is combined with the flocculating agent in step (a), the aliquot being from about 5% to about 15% by volume of the syrup;

(c) diluting the aliquot with an amount of water sufficient to adjust the Brix of the aliquot to about 35° to 45° and form a diluted aliquot;

(d) aerating the diluted aliquot to form a super-aerated aliquot, wherein the diluted aliquot is maintained at a temperature of from about 25° C. up to about 90° C.;

(e) dispersing in the syrup by substantially non-turbulent agitation for up to about 180 seconds, an amount of 0.05% to 0.3% aqueous polyacrylamide electrolyte solution;

(f) adding the super-aerated aliquot to the syrup and mixing to form an aerated syrup with a secondary flotation floc;

(g) allowing the secondary floc to float and form a floating scum and a substantially purified sugar syrup; and

(h) separating the scum and the purified syrup.

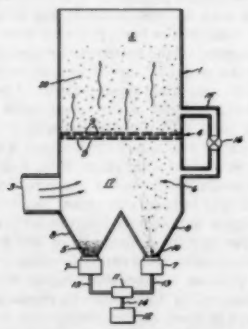
4,478,646
APPARATUS AND METHOD FOR CLEANING A FLUIDIZED BED GAS DISTRIBUTOR

Masayoshi Kuwata, Ballston Lake, and Stanley P. Urbaetis, Mechanicville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 280,764, Jul. 6, 1981, abandoned. This application Jun. 15, 1982, Ser. No. 388,562

Int. Cl.³ B08B *7/00*

U.S. Cl. 134—7 **9 Claims**



7. A method of cleaning a fluidized bed gas distributor having gas passages therethrough for fluidizing a material, comprising:

supplying a particulate cleaning medium of particle size smaller than said gas passages, wherein said cleaning medium comprises the same substance as said material;

imparting motion to said cleaning medium, while fluidizing said material, such that at least a portion of said cleaning medium contacts said gas distributor from the gas input side thereof with a velocity sufficient to remove at least a portion of any matter adhering to a surface of said gas distributor;

permitting at least a portion of said cleaning medium to pass through said passages; and

replenishing from said material said cleaning medium which passes through said passages.

4,478,647
PROCESS FOR THE TREATMENT OF SPENT PICKLING PASTE

Josef Rones; Siegfried Moller, both of Frankfurt am Main, and Kurt Moesner, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Parker Chemical Company, Madison Heights, Mich.

Filed Aug. 18, 1983, Ser. No. 524,503

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230603

Int. Cl.³ C23G *1/36*

U.S. Cl. 134—13 **11 Claims**

1. A process for treating spent fluoride-containing pickling paste on a metal surface which comprises applying to said spent pickling paste on said metal surface an aqueous treating paste composition which comprises calcium carbonate having a particle size not in excess of about 5 microns and an alkali metal bicarbonate, which composition has a pH which is not in excess of about 9.5, and maintaining said aqueous treating paste composition in contact with the spent pickling paste for a period sufficient to effect the reaction of the fluoride ions in the pickling paste with the calcium ions in the aqueous treating paste.

4,478,648
METHOD OF PRODUCING PROTECTIVE OXIDE LAYERS

Hans Zeilinger, Puchheim; August Muhlratzer, Gilching, and Bruno Stemmler, Karlsfeld, all of Fed. Rep. of Germany, assignors to MAN Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,770

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215314

Int. Cl.³ C23F *7/02*

U.S. Cl. 148—6.3 **9 Claims**

1. A method of producing a protective oxide layer on an object made of a titanium alloy, comprising the steps of:

pretreating the surface of the object,

thereafter oxidizing the surface of the object by heating it at a temperature in the range between about 500° and 900° C. in the presence of a gaseous mixture including an oxidizing agent, selected from the group consisting of water vapor and carbon dioxide, mixed with an inert carrier gas, the oxidizing being carried out without reducing the pressure of the gaseous mixture below atmospheric, and

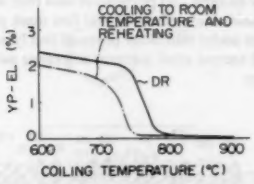
adjusting the oxidation potential of the oxidizing agent so as to selectively oxidize only the titanium constituent of the alloy to form the low valence oxide Ti_2O_3.

4,478,649

METHOD FOR PRODUCING A COLD-ROLLED STEEL SHEET HAVING EXCELLENT FORMABILITY

Osamu Akisue; Seiryo Hatae; Hiroaki Toki, all of Himeji; Kichi Nakazawa, Tokai, and Atsuhiro Wakako, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 464,067
Claims priority, application Japan, Feb. 9, 1982, 57-18188
Int. Cl.³ C21D *8/04*
U.S. Cl. 148—12 C 7 Claims



1. A method for producing a cold-rolled steel sheet having excellent formability, comprising the steps of:

continuously casting a steel containing 0.005% or less of carbon, from 0.01 to 0.10% of acid-soluble aluminum, and 0.006% or less of nitrogen, the amount of said aluminum being sufficient to suppress aging due to nitrogen at the coiling temperature defined below, the balance of the steel consisting essentially of iron and unavoidable impurities;

hot-rolling the resultant continuously cast slab, with the proviso that the temperature of the continuously cast slab is maintained above the Ar_3 point until the slab is hot-rolled;

coiling the resultant hot-rolled steel strip at a temperature of at least 780° C.;

cold-rolling the hot-rolled steel strip; and

continuously annealing the cold-rolled steel strip.

4,478,650

WATER SOLUBLE FLUX

Frank M. Zado, Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 19, 1983, Ser. No. 543,649
Int. Cl.³ B23K *35/34*
U.S. Cl. 148—23 21 Claims

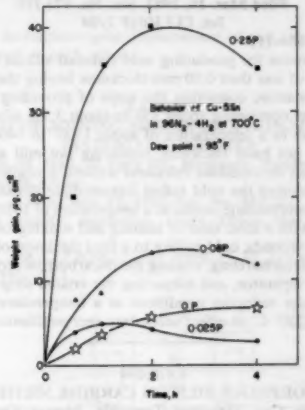
1. A rosin free water soluble flux comprising a high molecular weight polyalkylene glycol amine activator, a water soluble acid activator in an amount which essentially neutralizes the amine and a solvent mixture.

4,478,651

PROTECTIVE FILM ON CU-SN ALLOYS

Andrew J. Brock, Cheshire, and Frank N. Mandigo, Northford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 446,758, Dec. 3, 1982, Pat. No. 4,443,274.
This application Oct. 3, 1983, Ser. No. 538,252
Int. Cl.³ B32B *15/04*
U.S. Cl. 148—31.5 6 Claims



1. A copper-tin alloy having improved tarnish resistance, said alloy comprising:

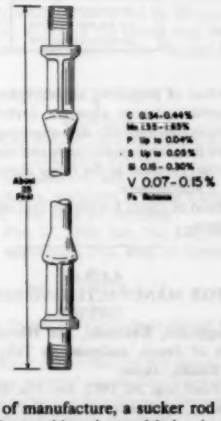
a substantially continuous, thermally produced layer of tin-phosphorous-oxide on at least one surface of said alloy.

4,478,652

CLASS D SUCKER RODS

Robert T. Woodings, 134 South Dr., Pittsburgh, Pa. 15238

Filed Jul. 9, 1982, Ser. No. 396,702
Int. Cl.³ C22C *38/04*
U.S. Cl. 148—36 2 Claims



1. As an article of manufacture, a sucker rod meeting API Class D specifications, said sucker rod being in the as-forged and as-normalized condition and made of steel consisting essentially of:

0.34 to 0.44 percent carbon,

1.35 to 1.65 percent manganese,

up to 0.04 percent phosphorus,

up to 0.05 percent sulfur,

0.15 to 0.30 percent silicon,
0.07 to 0.15 percent vanadium,
balance iron and incidential impurities.

4,478,653

PROCESS FOR PRODUCING GRAIN-ORIENTED SILICON STEEL

Martin F. Littmann, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Mar. 10, 1983, Ser. No. 473,775
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—111 **11 Claims**

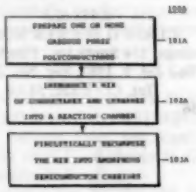
1. A process for producing cold reduced silicon steel strip and sheet of less than 0.30 mm thickness having the cube-on-edge orientation, consisting the steps of providing a slab of silicon steel containing about 3% to about 3.5% silicon, heating the slab to a temperature of about 1300° to 1400° C., hot rolling to hot band thickness, removing hot mill scale, cold rolling to an intermediate thickness without annealing said hot band, subjecting the cold rolled intermediate thickness material to an intermediate anneal at a temperature of 1010° to about 1100° C. with a total time of heating and soaking of less than about 180 seconds, cold rolling to a final thickness of less than 0.30 mm, decarburizing, coating the decarburized strip with an annealing separator, and subjecting the coated strip to a final anneal under reducing conditions at a temperature of about 1150° to 1250° C. to effect secondary recrystallization.

4,478,654

AMORPHOUS SILICON CARBIDE METHOD

Shek-Chung Gau, Hamilton Township, Mercer County, and Vikram L. Dalal, Lawrenceville, both of N.J., assignors to Chronar Corporation, Princeton, N.J.

Filed Jan. 7, 1982, Ser. No. 337,628
Int. Cl.³ H01L *21/205*
U.S. Cl. 148—174 **13 Claims**


100
PREPARE ONE OR MORE GASEOUS PHASE POLYSEMICONDUCTANES
101A
INTRODUCE A MIX OF HYDROCARBONS AND HYDRIDES INTO A REACTION CHAMBER
102A
PYROLYTICALLY DECOMPOSE THE MIX INTO AMORPHOUS SEMICONDUCTOR CARBIDE
103A

1. The method of preparing an amorphous semiconducting alloy of a semiconductor element, carbon, and hydrogen, which comprises pyrolytically decomposing a gaseous mixture of one or more polysemiconductanes and one or more carbanes exerting a partial pressure in the range above about 1 Torr and below about 1 atmosphere.

7. The method of claim 1 wherein said mixture includes one or more dopants.

4,478,655

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Yoshihide Nagakubo, Kawasaki, and Hiroshi Momose, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 30, 1982, Ser. No. 434,311
Claims priority, application Japan, Dec. 10, 1981, 56-198862
Int. Cl.³ H01L *21/20*
U.S. Cl. 148—175 **20 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:

forming a SiO_2 film on a semiconductor layer;

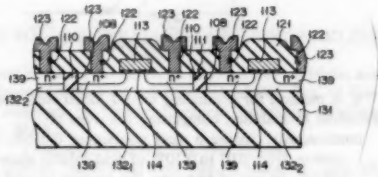
laying down a first mask pattern on said SiO_2 film;

using said first mask pattern, ion-implanting in said semiconductor layer an impurity of the conductivity type opposite to that of said semiconductor layer to form an ion injection layer of a conductivity type opposite to that of said semiconductor layer buried in said semiconductor layer;

forming a thin layer on at least the side surfaces of said first mask pattern;

selectively forming a second mask pattern on the portion of said SiO_2 film located between, and abutting, portions of said thin layer formed on said side surfaces of said first mask pattern, the material of said thin layer being different from the materials of said first and second mask patterns;

selectively etching said portions of said thin layer formed on at least said side surfaces of said first mask pattern and said SiO_2 film under said latter portions and lying between said first and second mask patterns to expose said semiconductor layer;



selectively etching the exposed portion of said semiconductor layer to form a trench substantially surrounding the implanted ions;

forming an element isolation region by burying an insulating material in said trench;

annealing said semiconductor layer to diffuse said impurity from said ion injection layer and thereby forming a well region of a conductivity type opposite to that of said semiconductor layer self-aligned with, and having a depth smaller than the depth of, said element isolation region in that portion of said semiconductor layer isolated by said element region;

forming an electronic element on said well region; and wiring said element for connection.

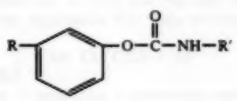
4,478,656

URETHANE COMPOUNDS AND CMDB PROPELLANTS STABILIZED THEREWITH

James D. Gibson, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 14, 1973, Ser. No. 413,401
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 **13 Claims**

1. Compounds of the formula

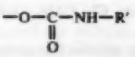


wherein

R is selected from the group consisting of

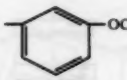
(a) $-OCH_3$ and

(b) radicals of the formula



R' is selected from the group consisting of C_1 to C_4 alkyl and

and R'' is selected from the group consisting of —OCH_3, —CH_3, Cl and H;
and when R is —OCH_3, R' is

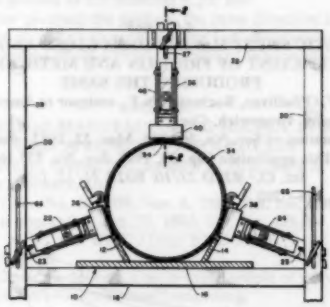


4,478,657

METHOD FOR STRENGTHENING DUCT CORES

Clifford A. Schroeder, Westlake, and Ralph L. Fogg, Chatsworth, both of Calif., assignors to C. A. Schroeder, Inc., San Fernando, Calif.

Filed Jan. 6, 1983, Ser. No. 456,336
Int. Cl.³ B65H *81/00*; F16L *11/11*
U.S. Cl. 156—64 **8 Claims**



1. A method of simultaneously testing and strengthening a flexible duct core of a wire coil helically wrapped with a flexible material comprising:
positioning said flexible duct core in an elongated tray;
engaging the sides of said flexible duct core with at least two arms having resilient wipers;
pulling said flexible duct core through said resilient wipers to stretch and test material bonds;
applying strengthening tape longitudinally to the surface of said flexible duct core as it passes between said wipers;
whereby said wipers press said tape securely to the sides of said flexible duct core as it is stretched and tested in said tray.

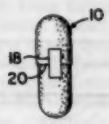
4,478,658

METHOD FOR SEALING NON-ENTERIC CAPSULES

Fritz Wittwer, Lupsingen, Switzerland, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 20, 1982, Ser. No. 451,573
Int. Cl.³ B29C *27/10*
U.S. Cl. 156—69 **30 Claims**

1. A method for sealing edible non-enteric capsules comprising telescopically engaged tubular capsule halves defining a junction seam and containing pharmaceutical ingredients, for the purpose of rendering such capsules tamper-proof and temper-evident, said method comprising adhesively bonding against at least a portion of said seam, a frangible edible label adapted to cover said seam at the point of intersection there-



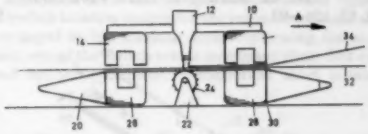
with and to fracture upon displacement of said capsule halves with respect to each other.

4,478,659

METHOD OF JOINING SHEETS OF A NON-MAGNETIC MATERIAL TOGETHER

Alethea R. M. Hall, 22 Park Rd., Bordeaux, Randburg, Transvaal, South Africa

Filed Nov. 17, 1982, Ser. No. 442,252
Claims priority, application South Africa, Nov. 24, 1981, 81/8148
Int. Cl.³ B29C *27/08*; B30B *15/30, 31/20*
U.S. Cl. 156—73.1 **17 Claims**



1. A method of joining two sheets of a non-magnetic material together along a join line comprises the steps of:
(a) locating the sheets in a zone between a magnet and a body which is attracted by the magnet to bring the sheets together;
(b) causing the sheets to be moved through the zone; and
(c) joining the sheets together in the zone or immediately after the sheets have passed through the zone.

16. Apparatus for use in a method of joining two sheets of a non-magnetic material together along a join line comprises a magnet and a body which is attracted by the magnet defining between them a gap in which the sheets may be located, and joining means located immediately after the gap for joining the sheets together.

4,478,660

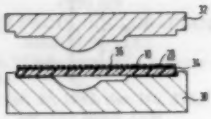
METHOD OF PLACING A DECORATIVE LAYER ON A CARRIER PANEL

Josef Landler, Wolfratshausen, and Max Mayr, Hart, both of Fed. Rep. of Germany, assignors to Alkor GmbH Kunststoffverkauf, Munich, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 124,969
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910234
Int. Cl.³ B32B *5/18*
U.S. Cl. 156—78 **25 Claims**

1. A method for forming a three-dimensional laminate comprising:
(a) applying a layer of a crosslinkable plastic foam onto a sheet of fibrous material, so that the foam permeates partially into the surface of the sheet of fibrous material and a layer of foam remains on the sheet;
(b) drying the foam;
(c) heating a carrier panel sheet containing a thermoplastic binder to plastify the binder;
(d) marrying the heated carrier panel sheet to the non-foam coated side of the fibrous sheet; and
(e) pressing the married layers from step (d) between two three-dimensionally shaped opposing pressing members to

form the desired shaped laminate and to at least partially crosslink the foam as a result of the heat from the pre-



heated carrier panel and embed fibers of said fibrous material into the binder of the carrier panel.

4,478,661

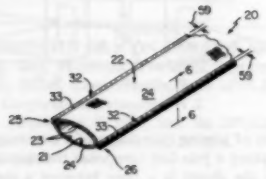
METHOD OF MAKING A REINFORCED COLLAPSIBLE HOSE CONSTRUCTION

Charles M. Lewis, Ocala, Fla., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 245,845, Mar. 20, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,205

Int. Cl.³ B32B *7/08, 31/20;* **F16L** *11/10*

U.S. Cl. 156—92 **9 Claims**



1. In a continuous method of making a collapsible reinforced hose construction comprising the steps of providing a tubular plastic inner component and providing a reinforcing tubular fabric cover component, the improvement in said method wherein said step of providing said inner component comprises providing a pair of substantially rectangular thermoplastic continuous layers, said step of providing said cover component comprises providing a pair of substantially rectangular fabric thermoplastic layers, and said method comprises the further steps of placing said layers with associated side edges thereof in aligned relation and with said thermoplastic continuous layers against each other, fixing all of said layers simultaneously together; said step of fixing including disposing thermoplastic fastening means through all of said layers so as to be located at and in said side edge portions and heat bonding all of said layers together by fusing associated edge portions of said thermoplastic continuous layers to each other and to adjoining side edge portions of said fabric layers and simultaneously heat bonding said thermoplastic fastening means to both sides of side edge portions of said layers as well as in said layers.

4,478,662

HONEYCOMB STRUCTURE CHUCKING

Demitrious Canellos, 89 Universe Dr., Levittown, N.Y. 11756

Continuation of Ser. No. 256,587, Apr. 22, 1981, abandoned. This application Nov. 17, 1982, Ser. No. 442,477

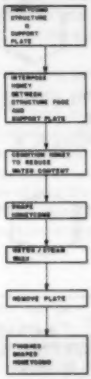
Int. Cl.³ B32B *31/00*

U.S. Cl. 156—155 **15 Claims**

1. A process for affixing a honeycomb structure to a plate in a manner whereby said structure and said plate may be chucked and the exposed surface of said honeycomb may be machined, said process comprising the steps of

applying to the surface of said plate a viscous coating of honey;

embedding one surface of said honeycomb in said viscous honey coating to leave the opposite honeycomb surface exposed for machining; and



heating said honeycomb, said plate and said honey coating to cure said coating to more tightly secure said honeycomb to said surface.

4,478,663

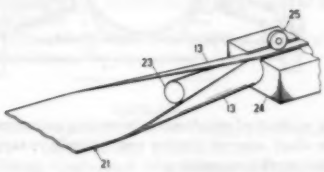
PLASTIC SHEET HAVING HIGH GLOSS AND LOW COEFFICIENT OF FRICTION AND METHOD FOR PRODUCING THE SAME

Eileen F. O'Sullivan, Rochester, N.Y., assignor to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 360,388, Mar. 22, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,166

Int. Cl.³ B29D *23/10;* **B32B** *31/12, 1/08*

U.S. Cl. 156—203 **3 Claims**



1. A method of producing a plastic sheet having a surface with both high gloss and low coefficient of friction characteristics, comprising the steps of:

(a) extruding a thermoplastic material to form a heated thermoplastic layer;

(b) pressing a surface of the heated, thermoplastic layer while still in a softened state with a chill roller which is maintained at a temperature at which it will cool and harden the surface of the layer to impress the surface characteristics of the chill roller upon the surface of the thermoplastic layer, the chill roller having a highly polished surface interrupted by minute depressions distributed over the surface of the roller, the depressions having an average depth of about 5 microns, a standard deviation of the depth of less than 3 microns, an average area for each depression of less than 16,000 square microns, and an average frequency of depressions over the surface of the roller of approximately 3,000 per square centimeter, the depressions being substantially convex and rounded about the periphery of the depressions, such that the surface of the thermoplastic layer has prominences formed thereon, corresponding to the depressions in the chill roller sur-

face, which are convex and rounded about their peripheries.

4,478,664

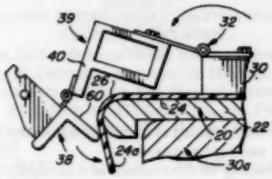
ROUND EDGE FORMER

Gilbert N. Elias, Phoenix, Ariz., assignor to Evans Rotork, Inc., Glendale, Ariz.

Division of Ser. No. 318,047, Nov. 4, 1981, Pat. No. 4,406,729. This application Jun. 20, 1983, Ser. No. 505,791

Int. Cl.³ B29C *17/04*

U.S. Cl. 156—216 **3 Claims**



1. A method for laminating a laminate about a 180° rounded edge of a substrate, said method comprising the steps of:

(a) pivoting a guide in one direction about a first pivot axis to progressively and continuously form the laminate about a first portion of the rounded edge; and

(b) further pivoting the guide in the same direction about a second pivot axis to progressively and continuously form the laminate about a second portion of the rounded edge.

4,478,665

METHOD FOR MANUFACTURING HIGHLY POROUS, HIGH STRENGTH PTFE ARTICLES

Daniel E. Hubis, Elkton, Md., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 204,509, Nov. 6, 1980, Pat. No. 4,385,093. This application Jan. 21, 1983, Ser. No. 459,804

Int. Cl.³ B29C *17/02*; B29D *27/00*

U.S. Cl. 156—229 **29 Claims**

1. A process for making a multi-layer article of porous expanded polytetrafluoroethylene comprising:

(a) intimately superimposing on top of one another at least two layers of unsintered polytetrafluoroethylene containing a liquid lubricant, at a temperature below the crystalline melt point of polytetrafluoroethylene;

(b) removing said lubricant from said multi-layer article;

(c) expanding in at least one direction said multi-layer article, from which the lubricant has been removed, at a rate exceeding 10% per second at an elevated temperature below the crystalline melt point of polytetrafluorethylene.

4,478,666

MEMBRANE SWITCH CONTROL PANEL ARRANGEMENT AND LABEL ASSEMBLY FOR LABELING SAME

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Division of Ser. No. 317,594, Nov. 2, 1981, Pat. No. 4,387,127, which is a division of Ser. No. 148,907, May 12, 1980, Pat. No. 4,347,416. This application Sep. 28, 1982, Ser. No. 426,068

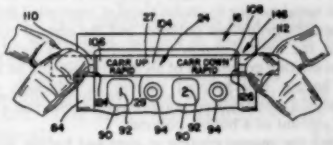
Int. Cl.³ B44C *1/16*; B32B *31/00*; H01H *9/00*; A61F *13/02*

U.S. Cl. 156—240 **2 Claims**

1. The method of making a legend sheet for a membrane switch control panel arrangement of generally quadrilateral configuration that includes a circuit board having circuitry integrating a predetermined number of consecutively numbered control input and output switches including for each switch a switch set including a pair of contacts on one side of the board to be manually closed and a bulb connected for illumination when the switch is closed and a viewing aperture in the board, adjacent the set contacts, through which the bulb is visible when so illuminated, a membrane sheet of flexible non-metallic material coextensive with and overlying said one side of the board with one side of same engaging said board side, said membrane sheet being formed to define first apertures aligned with each switch contact pair respectively and having secured over each of its said first apertures on the other side of same a planar electrically conductive switch contact closing member of film thickness dimensions for manual closing of aperture exposed switch contacts, said membrane sheet including second apertures, respectively, aligned with the bulb viewing aperture of the respective switch sets, said legend sheet, which is of flexible non-metallic material and is coextensive with and overlies said other side of membrane sheet with one side of said legend sheet engaging said other side of said membrane sheet, with said legend sheet bearing location indicia for the respective switches by corresponding consecutive number starting at its top and viewing apertures of the respective switch sets, and a rigid mounting sheet to which said circuit board is secured with said membrane sheet and said legend sheet disposed therebetween and with said mounting sheet being apertured to expose for viewing said legend sheet location indicia,

with said arrangement including the improvement wherein:

said circuit board switch sets, said membrane sheet first apertures and switch contact closing members thereof, said membrane sheet second apertures, and said legend sheet switch location indicia for the respective switch sets are arranged in like modular form comprising for each module one of the switch sets, a membrane sheet first and second apertures therefor, a membrane sheet contact



member for closing the module switch contacts, and legend sheet switch and viewing aperture location indicia for the module switch set, with the switch set of each module being oriented such that in the switch set thereof the contacts and viewing aperture are similarly oriented in side by side spaced apart relation, and with said modules being grouped in parallel, spaced apart rows that extend across the width of said panel arrangement of which each said row has an equal number of said modules, said rows being of substantially uniform height and length, and said modules forming each row being in columnar relation across the height of said panel arrangement,

said legend sheet defining for each of said rows and in proximity to same an elongate switch identification indicia receiving zone, with said zones being of substantially uniform length and height, and being substantially coextensive with the respective rows,

said method comprising:

after the functions of said switches have become identified, in terms of coordination of switch consecutive number identification and function indicia for each such switch by such consecutive switch numbers, when said circuitry has been assembled, taking a label assembly that comprises a release coated label carrier sheet bearing on said coating thereof a label forming sheet that is segmented to define individual labels of quadrilateral equal size configuration columnarly arranged lengthwise of said label assembly between the ends thereof,

applying to said labels in-field, starting at the top end of said carrier sheet, and to consecutive of said labels, lengthwise of said carrier sheet, the switch function indicia, in consec-

utive order of such switches, for the respective consecutively numbered switches employed in such panel arrangement, while said labels remain adhered to said carrier sheet,

and after all such switch function indicia of said panel arrangement have been applied to said consecutive labels of said label assembly,

consecutively removing the individual labels bearing said switch function indicia from said label assembly starting at its top end, and adhering same consecutively to corresponding consecutive of said legend sheet zones, starting at the legend sheet top end, to transfer all said labels bearing said in-field applied function indicia to said legend sheet in the consecutive order of said rows,

whereby said labels to be in-field applied to said legend sheet have such in-field function indicia applied thereto while remaining a part of such label assembly, after said functions of said switches has been determined by said circuitry having been assembled.

4,478,667

METHOD FOR EFFECTING HEAT SEALS OF CONTROLLED DETACHABILITY BETWEEN PROPYLENE POLYMERS AND ENAMEL COATED SURFACES

Chester W. Fitko, deceased, late of Chicago, Ill. (by Clare B. Fitko, administrator), assignor to The Continental Group, Inc., Stamford, Conn.

Continuation of Ser. No. 112,669, Jan. 16, 1980, abandoned. This application Mar. 23, 1981, Ser. No. 246,815

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.3 **19 Claims**

1. A method of bonding a propylene polymer to an enamel coated metal surface to obtain a seal of controlled detachability between the propylene polymer and the enamel coated metal surface, the method comprising applying to a metal surface an enamel coating comprised of an epoxy resin and an aminoplast resin having incorporated therein an adhesion promoting amount of a carboxylated polypropylene resin and a heat stabilizing amount of a butene polymer;

baking the enamel coating to cure and harden the coating;

heat sealing a propylene polymer layer to the hardened enamel coated metal surface and then

cooling the heat sealed assembly to ambient temperature whereby a seal of controlled detachability is obtained between the heat sealed surfaces.

4,478,668

LABELING MACHINE

George Gau, Obertraubling, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,308

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1984, 3302031

Int. Cl.³ B65C *9/16, 9/42*

U.S. Cl. 156—364 **8 Claims**

1. A labeling machine for containers such as bottles comprising a rotor driven rotationally about an axis; at least one pallet device mounted on said rotor radially spaced from said axis; said device including a pallet having a curved glue receiving surface and movable in an orbital path as said rotor rotates and oscillatable for rolling sequentially onto a glue applicator and a label which are located adjacent said orbital path; and, an improved device for maintaining said pallet out of contact with said applicator and label when no container will be present at the station where the glue bearing label would be transferred to a container;

said device comprising:

shaft means having an axis parallel to the rotational axis of the rotor and means for oscillating said shaft means,

carriage means on which said pallet is supported for presenting said curved glue receiving surface toward said glue applicator and label, and means for mounting said carriage means to said shaft means for shifting in a direction transverse to the axis of said shaft means between a neutral position wherein said pallet is retracted toward said rotor axis so the pallet cannot contact said glue applicator or label and an active position wherein said pallet is moved farther away from said rotor axis and can contact said applicator and label while the pallet oscillates,

a drive member mounted in said shaft means and engageable with said carriage means, and

means responding to the absence of a container at said station by actuating said drive member to drive said carriage to and hold it in neutral position and responding to the presence of a container at said station by actuating said drive member to drive said carriage to and hold it in active position.

4,478,669

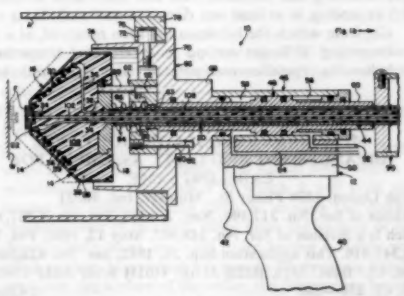
ADHESIVE BONDED GUN ASSEMBLY FOR APPLYING FASTENER

Albert M. Zeller, Sauk Village, and Edward W. Janes, Frankfort, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 27, 1984, Ser. No. 584,058

Int. Cl.³ B23K *13/00*; H01F *15/06*

U.S. Cl. 156—379.7 **11 Claims**



1. A gun assembly for bonding a fastener to a workpiece using heat induction to fuse a thermoplastic adhesive coating on the base of the fastener to the workpiece, comprising a head member to electrically non-conducting material which has a forward end and a rearward end, an electrical conductor mounted in said head member with a plurality of turns formed adjacent said forward end, means for selectively cooling said

head member, seating means on said forward end for receiving the fastener to be applied to the workpiece, a flux concentrator plate mounted on said forward end of said head member and surrounding said seating means, a body member slidingly supporting said head means, and drive means for selectively moving said head member between a retract position and a workpiece engaging position.

4,478,670

PROCESS AND APPARATUS FOR FORMING A TUBE FROM A FLAT WEB

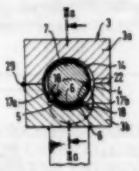
Klaus Heyse, Bad Soden, and Klaüs Andrae, Zornheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,226

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3145967

Int. Cl.³ B32B *19/02;* **B31F** *1/00;* **B29D** *23/00, 23/10*

U.S. Cl. 156—380.1 **18 Claims**



1. An apparatus for forming a tube from a flat web, comprising:

means for supplying a flat web comprising cellulose and having longitudinal edges;

means for providing an adhesive material to at least one of the longitudinal edges of said flat web;

means for forming said flat web into a tube, wherein the edges of said web abut or overlap, said forming means comprising a forming body which includes an internal bore of substantially circular cross-section, the circumference of said internal bore being equal to the outer circumference of said formed tube, said internal bore extending at least in the region whereat said tube is completely formed, for supporting the outer surface of said formed tube, and wherein said forming body further comprises a substantially cylindrical internal mandrel having a circumference which is equal to or smaller than the internal circumference of said formed tube, for supporting the inner surface of said formed tube, at least a part length of said internal mandrel being arranged in the interior of said internal bore of said forming body;

means for guiding at least one of said longitudinal edges of said web along a straight line parallel to the direction of travel;

means for separating said edge zones at a distance from one another during tube formation, wherein said guiding and separating means comprises a flexible strip comprising a curved cross section adaptable to the circumference of said tube and at least one radially projecting edge providing for said parallel travel of said web, said flexible strip being fixed by at least one radially projecting edge to at least either one of the inner surface of said internal bore or the circumferential surface of said internal mandrel and extending upstream of said internal bore and said internal mandrel, for engaging said web as said tube is formed;

means for contacting said edge zones with each other; and

means for joining said edge zones to form said tube.

4,478,671

ROLLER-TYPE LIQUID-ADHESIVE APPLICATOR

James D. Freeman, 11 W. Grand Ct., Springfield, Ill. 62704

Filed Mar. 16, 1983, Ser. No. 475,733

Int. Cl.³ B65C *11/04;* **B32B** *31/00;* **B44D** *3/28;* **B43M** *11/02*

U.S. Cl. 156—391 **8 Claims**

1. A roller-type liquid-adhesive applicator, comprising: a hollow cylindrical somewhat flexible plastic adhesive-holding reservoir member having a plurality of closely adjacent pairs of normally self-closing slits parallel to the axis of said reservoir member and oppositely inwardly angled roughly midway between radial and tangential orientation; end caps for said reservoir member; handle means for holding and axially rotatably manipulating said applicator; and axially elongated mound-shaped protuberances equally circumferentially spaced on the surface of said reservoir member for the adhesive-dispensing opening of said slits when said applicator is pressed against a surface to be adhesive-coated.

4,478,672

DEVICE FOR JOINING PLIES FOR TIRES

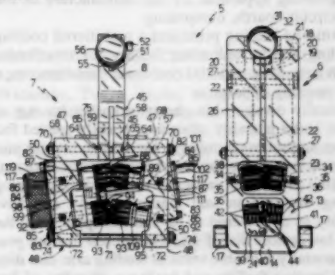
Hans Precht, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 15, 1982, Ser. No. 398,533

Claims priority, application Italy, Jul. 15, 1981, 67978 A/81

Int. Cl.³ B29C *19/00;* **B29H** *17/00;* **B32B** *31/04;* **B31F** *5/00*

U.S. Cl. 156—421 **6 Claims**



1. A compact, motorized tool for joining uncured elastomeric plies of tires on a rigid support, said tool comprising a first and second plurality of pairs of rollers, said rollers being rigidly interconnected, the rollers of each of said pairs being arranged in a V configuration along an axis of displacement of the tool relative to two plies to be joined, said two pluralities of rollers being adapted to cooperate with opposite surfaces of said two plies to be joined along facing edges disposed on opposite sides of said axis; and a separator blade being arranged upstream from said rollers; said tool being characterized in that it further comprises a first and a second body supporting said first and second plurality of pairs of rollers respectively, said two bodies being pivotally connected to each other for relative rotation about an axis perpendicular to said axis of displacement; adjustment means interposed between said two bodies to adjust their relative angular position about said axis of rotation; and driving means to rotate the rollers of one of said pluralities of rollers about their axes, the rollers of the other plurality of

rollers being idle, said rollers being substantially cylindrical in shape and being each arranged with its lateral surface facing the lateral surface of at least one corresponding roller of the other plurality of rollers, the rollers of each of said pair of rollers being disposed with their facing ends substantially in contact along a generatrix, and at least each of said driven rollers having lateral serrations adapted to positively engage the respective ply, said pairs of driven rollers and said pairs of idle rollers being subdivided into two groups which are aligned along said axis of displacement, the lateral serrations of the driven rollers of that of said groups which is closest to said separator blade comprising a helical threading, said rollers of each pair of driven rollers and at least one of each pair of idle rollers of the other of said groups being rigidly connected together angularly by coupling means.

4,478,673

PRESSING APPARATUS WITH MULTI-PLATEN OR TIERED PRESSES

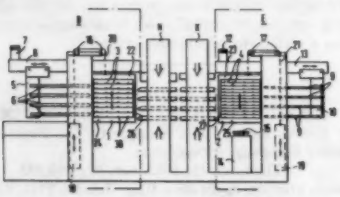
Werner Plocher, Horb, Fed. Rep. of Germany, assignor to Maschinenfabrik Lauffer GmbH & Co. KG., Horb, Fed. Rep. of Germany

Filed Oct. 27, 1982, Ser. No. 436,965

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143913

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—498 **13 Claims**



1. A pressing apparatus for the manufacture of multilayer printed circuit boards, comprising:

a multitiered heating press and a multitiered cooling press;

a loading and an unloading facility for transferring tools, with a pressing material contained therebetween, through the pressing apparatus;

a vertically displaceable charging basket having an upper edge and a plurality of shelves equally spaced from each other and whose number is equal to an integer multiple of at least two times the number of tiers in said multitiered heating press, said vertically displaceable charging basket being disposed in said loading facility and having the ability to be lowered so far that its upper edge lies under the lowermost tier of said multitiered heating press; and

a horizontally movable vertical feeding arm also disposed in said loading facility and having a plurality of horizontal push rods corresponding in number to the number of tiers in said multitiered presses so as to provide for a synchronous insertion of the tools from the charging basket into all of the tiers of said multitiered heating press and said multitiered cooling press alternately.

4,478,674

APPARATUS FOR SUPPORTING AND ALIGNING SPLICING TAPE ON A SPLICING WHEEL

Richard L. Clark, Burlington, N.C., assignor to Concept Design, Inc., Burlington, N.C.

Filed Sep. 27, 1982, Ser. No. 424,283

Int. Cl.³ B31F *5/06*; B65H *69/06*

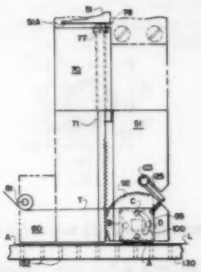
U.S. Cl. 156—505 **4 Claims**

1. In a tape splicing apparatus of the type wherein splicing tape is applied to a splicing tape applicator wheel having a plurality of planar, tape carrying surfaces, said applicator wheel adapted for movement to and from two tape ends to be spliced whereby the tape carrying surface contacts the two tape ends and applies the splicing tape thereto in lateral and longitudinal alignment therewith, the improvement which comprises:

(a) a first support lying flush with and overlapping substantially all of the tape carrying surface of the applicator on one axial side thereof and mounted for unison translation with said applicator;

(b) a second support lying flush with and overlapping substantially all of the tape carrying surface of said applicator on the other side thereof and also mounted for unison translation with said applicator, said first and second supports defining therebetween a splicing tape path substantially the same width as the splicing tape which guides the splicing tape onto the tape applying surface of the applicator and maintains proper lateral and longitudinal alignment of the splicing tape with the two tape ends to be spliced during movement of the applicator wheel;

(c) extension means cooperating with said first and second supports and said applicator for extending the tape carrying surface to a plane beyond the extent of said first and



second supports immediately prior to its contact with the two tape ends to be spliced so as not to interfere with the application of the tape;

(d) port means communicating with each of the planar tape carrying surfaces of said applicator wheel; a source of negative air pressure communicating with said port means and adapted for aiding and retaining the splicing tape on the tape carrying surface of said applicator wheel while said applicator wheel is rotated into position for application of the tape to the two tape ends to be spliced and further wherein said two tape ends to be spliced are held in splicing position by means of negative air pressure;

(e) including a source of positive air pressure communicating with said port means and air pressure control means for applying negative air pressure to the splicing tape to hold the splicing tape on the tape carrying surface until the instant of contact with the tape ends to be spliced and upon contact applying positive air pressure to said splicing tape to aid in removing the splicing tape from the tape carrying surface and mating the splicing tape to and firmly adhering the splicing tape to the tape ends to be spliced without air pockets between the respective tapes.

4,478,675

METHOD OF PRODUCING GaAs SINGLE CRYSTALS DOPED WITH BORON

Shin-ichi Akai, Itami, Japan, assignor to Sumitomo Electric Industries, Inc., Osaka, Japan

Filed Sep. 14, 1982, Ser. No. 418,174

Claims priority, application Japan, Sep. 18, 1981, 56-148335

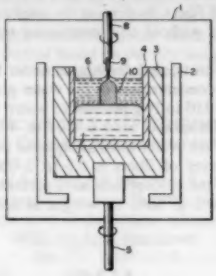
Int. Cl.³ C30B *15/04*

U.S. Cl. 156—605 **12 Claims**

1. In a method of producing GaAs single crystals doped with boron and having a lowered dislocation density from a GaAs

melt covered with B_2O_3 melt as a liquid encapsulant, the improvement comprising:

using a crucible made of a material selected from the group consisting of PBN, AlN and Al_2O_3 as a crucible for holding the GaAs melt, adding 0.25 to 0.95 atomic percent of



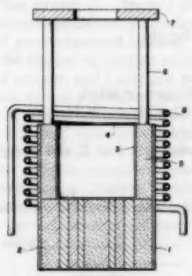
boron to said GaAs melt under conditions such that the residual oxygen quantity is at most 5×10^{-2} mole percent to said GaAs melt, thereby adjusting the concentration of boron in the grown crystal to 2×10^{18} to 1×10^{19} atoms per cm^3.

4,478,676

METHOD FOR DECREASING RADIAL TEMPERATURE GRADIENTS OF CRYSTAL GROWTH MELTS UTILIZING RADIANT ENERGY ABSORPTIVE MATERIALS AND CRYSTAL GROWTH CHAMBERS COMPRISING SUCH MATERIALS

Roger F. Belt, Morristown, and Robert Uhrin, Landing, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Sep. 7, 1982, Ser. No. 415,764
Int. Cl.³ C30B *15/02*
U.S. Cl. 156—616 R **20 Claims**



1. In a method of crystal growth wherein crystal is formed from a melt in a crucible having insulation aroound the sides thereof, with said melt emitting near infrared radiation, the improvement which comprises absorbing in said insulation a substantial portion of the near infrared radiation emitted radially outwardly from the melt.

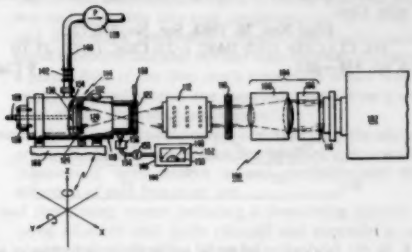
7. In a crystal growth chamber wherein crystalline compositions are formed from a melt, said growth chamber having a crucible with sidewalls for containing said melt, the improvement which comprises an insulating material comprising trivalent dysprosium surrounding at least a portion of the sidewalls of said crucible, said trivalent dysprosium being a refractory comprising an efficient absorber of near infrared radiation emitted by the melt at its formation temperature.

4,478,677

LASER INDUCED DRY ETCHING OF VIAS IN GLASS WITH NON-CONTACT MASKING

Lee Chen, Poughkeepsie, N.Y.; Tung J. Chuang, Los Gatos, Calif., and Gangadhara S. Mathad, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,524
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—635 **21 Claims**



13. A method for dry etching a glass layer, the method comprising the steps of:

a. mounting the glass layer to be etched in a vacuum chamber;

b. establishing a vacuum in the chamber;

c. controllably introducing a halogen base gas mixture into the chamber to wet the glass layer surface to be etched;

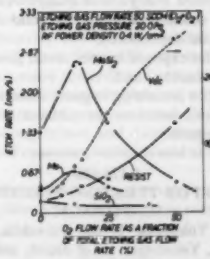
d. imaging a light beam of predetermined wavelength and beam pattern through the gas and onto the surface of the layer to be etched to excite the layer where the light impinges so as to activate the gas that has wet the layer surface to form an etch specie which etches the layer surface in conformity with the beam pattern.

4,478,678

METHOD OF REACTIVE ION ETCHING MOLYBDENUM AND MOLYBDENUM SILICIDE

Tohru Watanabe, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 28, 1984, Ser. No. 584,530
Claims priority, application Japan, Mar. 7, 1983, 58-36924
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*
U.S. Cl. 156—643 **8 Claims**



1. In a vacuum chamber including a pair of spaced electrodes, a method of reactive ion etching the surface of a sample mounted on one of the electrodes, the surface comprising molybdenum silicide, said method comprising the steps of:

introducing into the vessel a mixture consisting of chlorine gas and oxygen gas, the flow rate of the oxygen gas being

being less than about 30% of the total flow rate of the mixture; and

generating a discharge between the electrodes by applying a high frequency voltage to the electrodes.

4,478,679

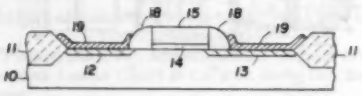
SELF-ALIGNING PROCESS FOR PLACING A BARRIER METAL OVER THE SOURCE AND DRAIN REGIONS OF MOS SEMICONDUCTORS

Jenq-Sian Chang, San Jose, and Yih-Jau Chang, Cupertino, both of Calif., assignors to Storage Technology Partners, Louisville, Colo.

Filed Nov. 30, 1983, Ser. No. 556,722

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—653 **9 Claims**



1. In the fabrication of metal oxide semiconductors, a self-aligning process method for adding a barrier metal layer over source and drain regions of said semiconductors, after said semiconductors have been formed but before any metal contacts used in the interconnection of said semiconductors are added, said formed semiconductors including a substrate, spaced-apart source and drain regions embedded into said substrate, an upwardly protruding gate region overlying the space between respective source and drain regions, and an upwardly protruding insulating region overlying the surface of said substrate everywhere except over said source, drain and gate regions, whereby depressions are formed over said source and drain regions as defined by the upwardly protruding insulating and gate regions, said self-aligning method comprising the steps of:

(a) placing a layer of oxide over the entire surface of said semiconductors;

(b) removing all of said oxide except that oxide placed on the sides of the upwardly protruding gates of said semiconductors;

(c) placing a layer of barrier metal over the entire surface of said semiconductor;

(d) placing a layer of organic material over said barrier metal, said layer of organic material being applied until an upper surface of said organic material is substantially smooth and free of depressions;

(e) removing said layer of organic material until said barrier metal is exposed everywhere except over said depressed source and drain regions, where said organic material remains in said depressions;

(f) removing the exposed barrier metal from the surface of said semiconductors; and

(g) removing the remaining organic material, thereby leaving said barrier metal on the surfaces of said source and said drain regions.

4,478,680

METHOD FOR TREATING ELECTROLYTIC DIAPHRAGM

Takeshi Adachi, Yokosuka; Tetsuo Takeshita, Tokyo, and Itsuaki Matsuda, Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Continuation of Ser. No. 240,366, Mar. 4, 1981, abandoned. This application Mar. 2, 1983, Ser. No. 471,459

Claims priority, application Japan, Sep. 5, 1978, 53-108056

Int. Cl.³ C25B *13/00*

U.S. Cl. 162—103 **4 Claims**

1. A method for treating an electrolytic diaphragm, said diaphragm including a layer of asbestos fibers adhered to the surface of an electrolytic cathode made of a wire mesh or porous plate, said method comprising

permeating water glass into substantially the entire thickness of said layer of fibers of the diaphragm, by dipping the diaphragm in an aqueous solution of the water glass,

permeating a chloroprene latex into substantially the entire thickness of the thus treated layer of fibers in a wet state of the layer of fibers, by dipping the diaphragm in the chloroprene latex without any intervening treatment of the fibers, and

drying the thus treated diaphragm under heat,

wherein the concentration of the water glass in the aqueous solution is 0.05 to 10 g per liter of water, the concentration of the chloroprene latex is 0.01 to 4% by weight, the amount of the water glass as aqueous solution permeated into the layer of fibers is 0.5 to 2 liters/dm^2, and the amount of the chloroprene latex permeated into the layer of fibers is 2 to 50% by weight as solids based on the asbestos.

4,478,681

FORGERY-PROOF PAPER

Friedhelm Müller, Odenthal, and Horst Nickel, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

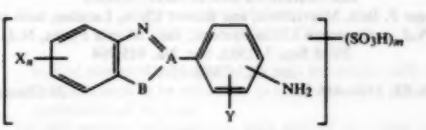
Filed Jul. 22, 1982, Ser. No. 400,834

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132146

Int. Cl.³ D21H *5/10*

U.S. Cl. 162—140 **2 Claims**

1. Forgery-proof paper which exhibits a distinct colouration when treated with an oxidising agent and, if appropriate, a reducing agent, characterized in that it contains, as the reagent, a compound of the formula



or a salt thereof, wherein

A represents C,

B represents S,

R represents hydrogen or alkyl,

X represents H, Cl, CH_3 or OCH_3,

Y represents H or CH_3,

n represents the numbers 1 or 2, and m represents the number 2,

and wherein

the amino group is located in the m-position or p-position to A.

4,478,682

SIZING METHOD AND SIZING COMPOSITION FOR USE THEREIN

Ralph A. Bankert, New Castle, and David H. Dumas, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 279,914, Jul. 2, 1981, Pat. No. 4,407,994. This application Sep. 21, 1982, Ser. No. 420,980

Int. Cl.³ D21H *3/58*

U.S. Cl. 162—158 **3 Claims**

1. In the method of producing sized paper wherein there is employed in the internal or external sizing thereof an aqueous emulsion of a ketene dimer sizing agent, the improvement wherein there is employed in combination therewith an aqueous solution of a water-soluble resinous reaction product (A) derived by reaction of (i) an epihalohydrin, (ii) a water-soluble polyaminopolyamide resin, and (iii) a composition comprised

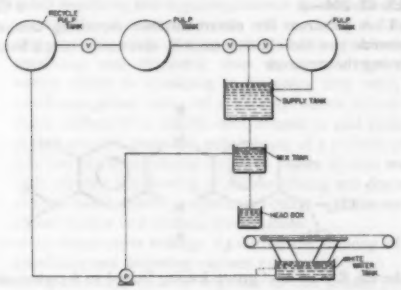
of from about 20% to about 65% by weight of bis(hexamethylene)triamine wherein (iii) is used in an amount of from about 2 to 10 parts by weight for each part by weight of (ii) and (i) is used in an amount of from about 0.5 mole to about 1.5 moles for each basic amino group present in (ii) and (iii), said component (iii) being the residue obtained after recovery of hexamethylenediamine from its manufacture by hydrogenation of adiponitrile, the amount of (A) employed being sufficient to provide sized paper containing from about 0.05% to about 0.5% by weight thereof based on the dry weight of the paper.

4,478,683

ENZYMATIC CATALYZED BIOCIDE SYSTEM

Steve A. Orndorff, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 319,298, Nov. 9, 1981, Pat. No. 4,370,199. This application Sep. 27, 1982, Ser. No. 424,374
The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.
Int. Cl.³ D21F *1/66*
U.S. Cl. 162—161 **6 Claims**



1. A method for enzymatically killing and controlling the growth of microorganisms in an industrial process wastewater stream comprising:

(a) adding to the stream an effective amount of a plant or microbial dehydrogenase enzyme selected from the group consisting of peroxidase and laccase;

(b) adding to the stream an oxidant selected from the group consisting of oxygen and hydrogen peroxide;

(c) adding to the stream a sufficient quantity of an oxidizable monophenolic compound selected from the group consisting of black liquor, catechol, guaiacol, resorcinal and lignin to achieve the desired kill and control; and,

(d) reacting the dehydrogenase enzyme and oxidant in the stream to produce a catalytic oxidation of the monophenolic compound thereby producing quinone and hydroquinone derivatives that are toxic to the microorganisms in the stream.

4,478,684

PAPERMAKING MACHINE STOCK TRIM DEFLECTING DEVICE

Michael Kochndörfer, Berg; Rüdiger Kurtz, Immenstaad/B.; Werner Meurer, Tettnang; Werner Seider, Ravensburg, and Helmut Störr, Berg, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,755
Claims priority, application Austria, Jul. 14, 1982, 2737/82
Int. Cl.³ D21F *1/56, 1/06;* D21G *9/00*
U.S. Cl. 162—337 **10 Claims**

1. A papermaking machine comprising:

at least one dewatering means for forming a fiber web and movable in a predetermined direction of travel;

at least one headbox for infeeding fiber stock suspension to be applied to said at least one dewatering means along a flow path for the fiber stock suspension and impinging upon said at least one dewatering means at a predetermined impact location;

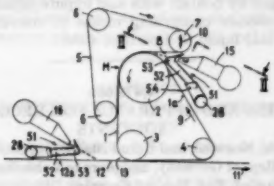
said at least one headbox possessing a predetermined operating width containing at least one marginal region and an outfeed slice extending across said operating width;

said at least one headbox being spaced from said dewatering means to permit said fiber stock suspension to be discharged from said outfeed slice in the form of a free stock jet having a predetermined flow direction;

at least one deflecting means operatively associated with said at least one marginal region of said at least one headbox and insertable into said predetermined flow path of said fiber stock suspension between said predetermined impact location and said outfeed slice in order to separate a partial flow of the fiber stock suspension which is to be engaged at said at least one marginal region from a main flow of said fiber stock suspension;

said at least one deflecting means containing a guide channel arranged adjacent said at least one headbox and extending transversely with respect to said predetermined flow direction of said free stock jet;

said dewatering means including a dewatering section located adjacent said guide channel and movable in said predetermined direction of travel;



said guide channel being substantially directed in said direction of travel of said dewatering section of said dewatering means located adjacent to said guide channel;

said guide channel comprising:

two side walls;

at least one guiding wall interconnecting said two side walls;

an end wall arranged at an end of said guide channel which is located downstream of said predetermined direction of travel of said dewatering means and which extends transversely with respect to said predetermined flow direction of said free stock jet;

said end wall together with said two side walls delimiting an inlet opening; and

said end wall containing a wall member which is substantially concavely configured towards said partial flow and serving to deflect said partial flow of said fiber stock suspension towards said at least one guiding wall;

a discharge member located upstream of said inlet opening with respect to said predetermined direction of travel of said dewatering means and extending outwardly of the region of said operating width of said at least one headbox; and

said guide channel being operatively connected in flow communication with said discharge member.

4,478,685

PACKED COLUMN DISTILLATION APPARATUS

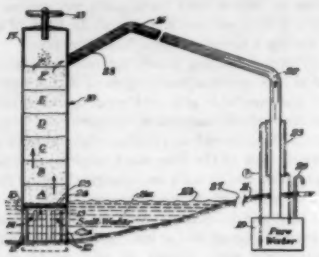
C. Walter Mortenson, 1175 Pleasant Hill Rd., Newark, Del. 19711

Division of Ser. No. 110,636, Jan. 9, 1980, Pat. No. 4,326,923. This application Nov. 12, 1981, Ser. No. 320,198
Int. Cl.³ B01D *3/16;* C02F *1/14*
U.S. Cl. 202—158 **3 Claims**

1. Apparatus for the purification of an impure volatile liquid

which apparatus comprises a distilling device comprising a column and a condenser;

in said column a capillary gradient comprising a column packing material varying in capillary activity, material of relatively low capillary activity being in closest position within said column to said impure liquid with capillary



material of successively better capillary activity being above it to form said gradient with material having the best capillary activity near the outlet of said column to said condenser, said material being substantially unchanged by contact with said impure liquid; and

said condenser comprising means to convert any vapors from said liquid to a purified state.

4,478,686

PROCESS AND APPARATUS FOR RECOVERY OF SOLVENTS

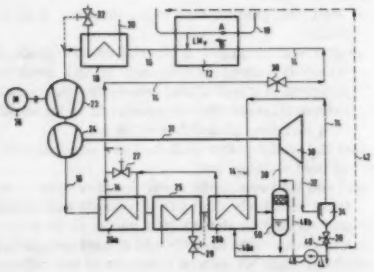
Peter Barth, Neuwied, and Bernd Blaudszun, Steinkirchen, both of Fed. Rep. of Germany, assignors to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,340

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038790

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—49 **18 Claims**



1. In a process for recovery of solvents in which a hot carrier gas stream laden with solvent vapors from an evaporation space is compressed prior to the removal of solvent, cooled, and expanded with production of work for condensing the solvent vapors and separating the solvent, and the carrier gas stream lean in solvent vapors is then returned into the evaporation space after being reheated, the improvement comprising transferring the whole of the work arising on expansion by direct mechanical coupling to one of two or more compression stages for compression of the carrier gas stream laden with solvent vapors, said compression being prior to solvent removal.

11. In an apparatus for the recovery of solvent in which there are included in a carrier gas circuit: an evaporation space in which a heated carrier gas stream is laden with solvent vapors, a compressor, a cooling device for condensing out the solvent vapors from the compressed carrier gas stream, an expansion apparatus, a solvent separator, and a device for reheating the carrier gas stream lean in solvent vapors; the improvement comprising means for feeding said heated carrier gas stream laden with solvent vapors directly to said compressor, and means to feed said compressor carrier gas stream directly into said device for condensing out the solvent vapors and wherein the expansion apparatus is directly mechanically coupled to one of at least two compressors.

4,478,687

PHENAZINE LEUCODYES FOR ELECTROCHROMIC RECORDING

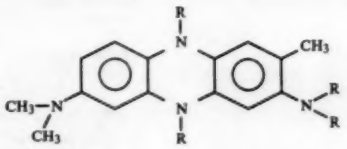
Paul L. Gendler, and Robert J. Twieg, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,030

Int. Cl.³ G01D *15/06*

U.S. Cl. 204—2 **5 Claims**

1. A substrate for electrochromic recording comprising bromide ions and characterized by also comprising a leucodye having the structure



wherein R is an acyl group having from 1 to 6 carbon atoms.

4,478,688

PROCESS OF MANUFACTURING SCREEN MATERIAL

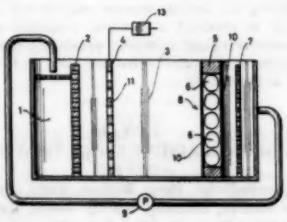
Johan A. de Hek, Arnhem, Netherlands, assignor to Veco Beheer B.V., Netherlands

Continuation-in-part of Ser. No. 306,246, Sep. 28, 1981, Pat. No. 4,397,715. This application Aug. 8, 1983, Ser. No. 521,386

Claims priority, application Netherlands, Sep. 30, 1980, 8005427

Int. Cl.³ C25D *1/08, 5/08*

U.S. Cl. 204—11 **17 Claims**



1. Process of electrolytically manufacturing screen material by depositing a metal upon a sieve-like porous matrix having apertures therethrough, the process comprising:

placing the matrix in an electrolytic bath, the bath containing at least one brightener, connecting the matrix as a cathode, spacing an anode from the cathode, flowing the bath liquid at least during part of the electrolytic deposition, through the apertures in the matrix connected as the cathode and only from the anode toward the cathode.

4,478,689

AUTOMATED ALTERNATING POLARITY DIRECT CURRENT PULSE ELECTROLYTIC PROCESSING OF METALS

David M. Loch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 31, 1981, Ser. No. 289,104
Int. Cl.³ C25D 5/18, 11/02
U.S. Cl. 204—14.1 48 Claims

1. A method for electroprocessing the surface of a metal, said method comprising the steps of:

immersing said metal surface and an electrode means in an electrolyte;

flowing anodizing and degassing current pulses between said metal and said electrode means, said anodizing and degassing current pulses having pulse widths which define anodizing and degassing time durations respectively which define an anodizing to degassing time ratio, said anodizing pulses being of a polarity which causes said metal surface to be anodic with respect to said electrode means and said degassing pulses being of a polarity opposite that of the anodizing pulses or pulses of zero magnitude wherein the flowing of said anodizing and degassing current pulses results in a process voltage V_p between said metal surface and said electrode means;

sensing the process voltage V_p during the flowing of said anodizing and degassing current pulses; and

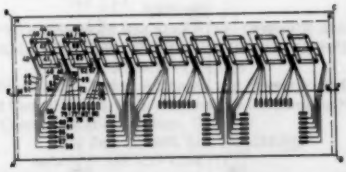
varying said time ratio in response to said sensed process voltage V_p to maintain V_p at a level below a predetermined burn voltage, V_b.

4,478,690

METHOD OF PARTIALLY METALLIZING ELECTRICALLY CONDUCTIVE NON-METALLIC PATTERNS

Eltjo Scholtens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,570
Claims priority, application Netherlands, Dec. 31, 1981, 8105922
Int. Cl.³ C23C 3/02
U.S. Cl. 204—15 4 Claims



1. A method of partially metallising electrically conductive non-metallic patterns on insulating substrates, characterized in that the part of the pattern to be metallised is immersed in an electroless plating solution and a potential difference is applied for a short period of time between the pattern and the solution so as to initiate the metal deposition.

4,478,691

SILVER PLATING PROCEDURE

Joseph A. Abys, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 310,610, Oct. 13, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,695
Int. Cl.³ C25D 3/46, 3/64
U.S. Cl. 204—43 R 13 Claims

1. A process for electroplating a metallic substance on a surface, said metallic substance consisting of at least 90 mole percent silver, comprising the step of passing current through a cathode, electroplating bath and anode with a cathode potential great enough to electroplate silver, said electrochemical bath having a conductivity greater than 10^{-3} mho-cm and pH greater than 7 characterized in that the electroplating bath is an aqueous solution comprising

a. a source of silver, said source of silver consisting essentially of silver-aliphatic polyamine complex in which the aliphatic polyamine has from 3 to 20 carbon atoms and substituents are selected from the group consisting of hydrogen, hydroxide, chloride and bromide and said aqueous solution has a silver concentration between 0.01 molar and saturation and an aliphatic polyamine concentration of from 2 to 12 times the mole concentration of silver and

b. a buffer, said buffer consisting essentially of the hydrogen phosphate/phosphate system with buffer concentration between 0.1 and 2 molar and with the ratio of hydrogen phosphate to phosphate ion from 5/1 to 1/5.

4,478,692

ELECTRODEPOSITION OF PALLADIUM-SILVER ALLOYS

Fred I. Nobel, Sands Points, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 452,144, Dec. 22, 1982, Pat. No. 4,465,563. This application Dec. 15, 1983, Ser. No. 561,152
Int. Cl.³ C25D 3/56, 3/64
U.S. Cl. 204—43 R 11 Claims

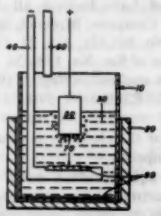
1. An aqueous electroplating solution for the electrodeposition of palladium-silver alloys comprising a soluble palladium compound, a soluble silver compound and an excess of a strong acid in an amount sufficient to maintain the palladium and silver compounds in solution without the addition of chloride or bromide ions and to bring the plating potential of palladium and silver sufficiently close to enable the plating of palladium and silver simultaneously to produce an alloy deposit.

4,478,693

INERT ELECTRODE COMPOSITIONS

Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 205,651, Nov. 10, 1980,. This application Jan. 20, 1983, Ser. No. 459,410
Int. Cl.³ C25C 3/00
U.S. Cl. 204—64 R 9 Claims



1. A method of electrolytically producing metal from a metal compound selected from the group consisting of metal

oxide and metal salt dissolved in a molten bath, the method comprising the steps of:

(a) providing an electrolytic cell containing a molten electrolyte salt for dissolving a metal compound therein;

(b) providing at least one electrode therein formulated from a combination metal compound defined by the formula:

$$\left(\sum_{i=1}^{m}(M_i)F_{Mi}\right)\left(\sum_{j=1}^{p}(M_j)F_{Mj}\sum_{i=1}^{m}(M_i)F_{Mi}\right)_Z\left(\sum_{r=1}^{n}X_rF_{Xr}\right)_K$$

where $\sum_{i=1}^{m}F_{Mi}=1$; $\sum_{j=1}^{p}F_{Mj}+\sum_{i=1}^{m}F_{Mi}=1$ and $\sum_{r=1}^{n}X_rF_{Xr}=1$;

Z is a number in the range of 1.0 to 2.2; K is a number in the range of 2.0 to 4.4; M_i is a metal having a valence of 1, 2, 3, 4 or 5 and is the same metal or metals wherever M_i is used in the formula; M_j is a metal having a valence of 2, 3 or 4, M_i and M_j being different metals; X_r is at least one of the elements from the group consisting of O, F, N, S, C and B; m, p and n are the number of components which comprise M_i, M_j and X_r; F_{Mi}, F_{Mj}, F'_{Mj}, F'_{Mi} or F_{Xr} are the mole fractions of M_i, M_j and X_r, and $0<\Sigma F'_{Mi}<1$ when $m>1$; and

(c) passing electrolytic current through the cell thereby forming metal from said metal compound dissolved in said molten bath.

4,478,694

METHODS FOR THE ELECTROSYNTHESIS OF POLYOLS

Norman L. Weinberg, East Amherst, N.Y., assignor to SKA Associates, Buffalo, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,614
Int. Cl.³ C25B *3/00*
U.S. Cl. 204—77 **35 Claims**

1. In a method of making ethylene glycol by the electrochemical reduction of a formaldehyde-containing electrolyte, the improvement comprising maintaining the pH of the electrolyte from above about 5 to below about 7 to provide an ethylene glycol current efficiency of at least 50 percent.

4,478,695

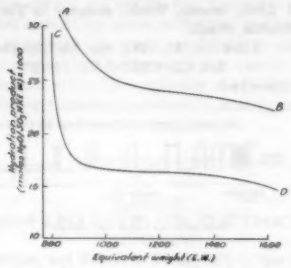
SULFONIC ACID ELECTROLYTIC CELL MEMBRANES AND USE THEREOF IN THE ELECTROLYSIS OF SODIUM CHLORIDE

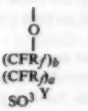
Bobby R. Ezzell, Lake Jackson; William P. Carl, Angleton, and William A. Mod, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 341,431, Jan. 21, 1982, Pat. No. 4,417,969, which is a division of Ser. No. 158,424, Jun. 11, 1980, Pat. No. 4,358,545. This application Sep. 2, 1983, Ser. No. 529,177
Int. Cl.³ C25B *1/34, 9/00, 134/02, 13/08*
U.S. Cl. 204—98 **7 Claims**

1. A process for the electrolysis of an aqueous alkali metal halide which comprises

(a) feeding an aqueous alkali metal halide solution into an anode compartment of an electrolytic cell in which there is an anode in the anode compartment and a cathode in a cathode compartment and in which the anode compartment is separated from the cathode compartment by an ion exchange membrane wherein the ion exchange membrane is a polymer comprising a substantially fluorinated backbone which has recurring pendant groups attached thereto and represented by the formula





where

a=0–3

b=0–3

a+b=at least 1

R_f and R'_f are independently selected from the group consisting of a halogen and a substantially fluornated alkyl group having one or more carbon atoms

Y is hydrogen or alkali metal wherein the polymer has an equivalent weight of between 800 and 1500 and has a hydration product of less than 22,000; and

(b) electrolyzing the aqueous alkali metal halide solution; and

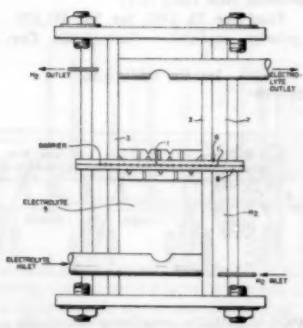
(c) removing an alkali metal hydroxide solution from the cathode compartment.

4,478,696

IONIZABLE REDUCING AND OXIDIZING GASEOUS SUPPLY MEANS AND PROCESS FOR CATALYTIC BARRIERS AND ELECTRODES

Robert J. Allen, Saugus, Mass., assignor to Prototech Company, Newton Highlands, Mass.

Filed Jul. 21, 1982, Ser. No. 400,254
Int. Cl.³ C25C *1/12, 1/20*
U.S. Cl. 204—105 R **11 Claims**



1. A process for introducing ionizable reducing and oxidizing gases into an electrochemical cell and the like having an electrolyte, that comprises, introducing a main portion of a catalytic electrode or barrier of gas permeable material into the electrolyte with a rim portion of the material external to the

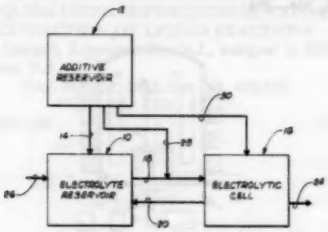
electrolyte in a chamber isolated from the electrolyte, the gas permeable material having a thickness that is small relative to its other dimensions, and flowing said gas in said chamber along said rim portion and then diffusing the gas in said gas permeable material from the rim portion to the main portion along paths that are perpendicular to the thickness of the material.

4,478,697

METHOD FOR ELECTRODEPOSITING METALLIC MANGANESE

Tommy W. Coleman, Aberdeen, and Robert A. Griffin, West Point, both of Miss., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Aug. 3, 1982, Ser. No. 404,727
Int. Cl.³ C25C *1/10*
U.S. Cl. 204—105 M **8 Claims**



1. A method for electrodepositing metallic manganese in an electrolytic cell having cathodes and anodes wherein the manganese is deposited on the cathodes during the electrodepositing process, the process comprising:

providing an electrolyte feed solution including metallic manganese;

adding water soluble polyacrylamides and natural guar gum additive to the electrolyte feed solution, the water soluble polyacrylamides and natural guar gum in combination being added to the electrolyte feed solution in a range from about 0.1 milligrams to about 10.0 milligrams additive per liter of electrolyte feed solution; and

electrodepositing metallic manganese on the cathodes in the electrolytic cell during electrolysis and increasing the amount of manganese deposited by about ten percent per ampere of electrical power consumed as compared to processes without the water soluble polyacrylamides and natural guar gum additive, the deposited manganese having relatively few nodules and dentritic forms thereby resulting in an improved quality of the deposited manganese due to less fines and the deposited manganese being removable from the cathodes by a mechanical means in an easier, more efficient manner.

4,478,698

PROCESS FOR RECOVERING COPPER AND MOLYBDENUM FROM LOW GRADE COPPER CONCENTRATES

Igor Wilkomirsky; Andres Reghezza, and Hector Petit-Laurent, all of Chuquicamata, Chile, assignors to Corporacion Nacional Del Cobre De Chile, Santiago, Chile

Filed Jan. 3, 1984, Ser. No. 567,876
Int. Cl.³ C25C *1/12*
U.S. Cl. 204—106 **16 Claims**

1. A process to recover copper and molybdenum from low grade copper concentrates which contain variable levels of copper and molybdenum comprising:

a. roasting the concentrates with air or oxygen enriched air at about 550 to 850 C. with up to about 200% excess air or oxygen enriched air over the stoichiometric, for sufficient reaction time to produce calcines and achieve an off gas containing at least about 1 volume percent SO_2,

b. leaching copper and molybdenum from said calcines with a dilute sulfuric acid solution for about 0.2 to 5 hours to form a pulp,

c. removing any solids from said pulp, to obtain a clear solution

d. solvent extracting molybdenum from the solution by treatment with a suitable solvent to form an organic phase and a raffinate,

e. stripping the molybdenum from said organic phase by washing with ammonium hydroxide and ammonium sulfate to form an ammonium molybdate solution,

f. precipitating the ammonium molybdate from said stripping solution,

g. crystallizing ammonium molybdate from said precipitate, and

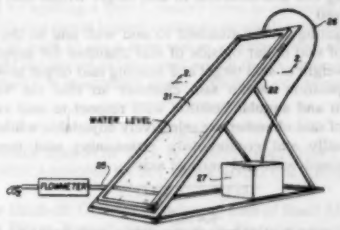
h. recovering copper from said raffinate by conventional methods.

4,478,699

PHOTOSYNTHETIC SOLAR ENERGY COLLECTOR AND PROCESS FOR ITS USE

Martin M. Halmann; Mira Ulman, both of Rehovot, and Benedict Aurian-Blajeni, Rishon Lezion, all of Israel, assignors to Yeda Research & Development Company, Ltd., Rehovot, Israel

Filed Apr. 22, 1981, Ser. No. 256,399
Claims priority, application Israel, May 9, 1980, 60033
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—158 R **12 Claims**



7. A process for the utilization of solar energy for the conversion of water and carbon dioxide to formic acid, formaldehyde and methanol, which comprises

providing a solar energy collector having a surface of a photoactive material inclined at an angle from the horizontal to define a lower end and an upper end, and having a means for maintaining in the collector a layer of water adjacent the photactive surface to a predetermined level;

passing a stream of carbon dioxide as bubbles through water adjacent said photactive layer while said photoactive layer is irradiated with solar radiation to effect conversion of said water and said carbon dioxide to formic acid, formaldehyde and methanol.

4,478,700

MAGNETIC SPUTTERING ANODE RECONDITIONING

Russell C. Criss, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

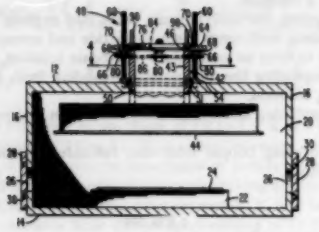
Filed Jan. 17, 1984, Ser. No. 571,404
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **8 Claims**

1. In a method of depositing dielectric coatings by cathode sputtering wherein the anode loses effectiveness as it becomes coated with dielectric material, the improvement which comprises depositing a conductive material over the dielectric coating on the anode.

4,478,701
TARGET SUPPORT ADJUSTING FIXTURE

Patrick G. Welch, Indianapolis, and Everett E. Mitchell, Plainfield, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,189
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **8 Claims**

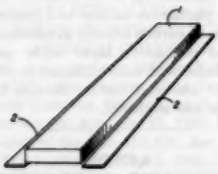


1. A sputtering apparatus for depositing thin films of material upon a substrate, said apparatus having:
(a) a vacuum chamber having a vertical axis;
(b) a wall separating said chamber from the ambient atmosphere;
(c) a target arranged in alignment with said vertical axis of said chamber;
(d) a target support collar projecting through said wall and being in vacuum sealing engagement therewith, said collar having one end attached to said target within said chamber; and
(e) mounting means attached to said wall and to the other end of said collar outside of said chamber for supporting the weight of said target and holding said target in operating position within said chamber so that the vertical height and angular position with respect to said vertical axis of said chamber are selectively adjustable while automatically and continuously maintaining said target in alignment with said vertical axis.

4,478,702
ANODE FOR MAGNETIC SPUTTERING APPARATUS

F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 17, 1984, Ser. No. 571,406
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **6 Claims**

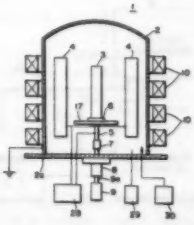


1. In an apparatus for coating a substrate comprising a cathode having a substantially planar surface consisting of a material to be sputtered, magnet means for producing a magnetic field having lines of flux which extend in a curve from said sputtering surface and return thereto to form a magnetic tunnel over a closed loop erosion region on said sputtering surface, an anode positioned to produce an accelerating electric field adjacent said sputtering surface for producing a glow discharge confined by said magnetic field to the region adjacent said sputtering surface and within said magnetic tunnel, and means for connecting said cathode and said anode to a source of electrical potential, the improvement which comprises said anode being symmetrically designed and positioned, and evenly spaced from the major dimension of said magnetic tunnel outside the zone of glow discharge confinement, and said anode extending only along the major dimension of the magnetic tunnel in order to provide a uniform sputtered coating.

4,478,703
SPUTTERING SYSTEM

Mizuo Edamura, Kobe; Takashi Kajikawa, Miki, and Koji Okamoto, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 29, 1984, Ser. No. 594,577
Claims priority, application Japan, Mar. 31, 1983, 58-55418; Mar. 31, 1983, 58-46924
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **3 Claims**

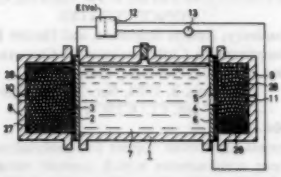


1. A sputtering system comprising:
a vacuum reaction furnace including a furnace body;
a workpiece located substantially is a central portion of said vacuum reaction furnace;
a plurality of targets located around said workpiece along the circumference of an imaginary circle and spaced apart from the workpiece a predetermined distance, said targets being spaced apart equidistantly from each other;
rotating means connected to said workpiece for rotating same; and
magnetic field generating means located within each said target and on an outer periphery of said furnace body for generating a magnetic field between said workpiece and each said target and a magnetic field located perpendicular to said magnetic field generated between said workpiece and each said target.

4,478,704
GAS DETECTION DEVICE

Tadahiko Miyoshi; Masanori Yoshikawa, both of Hitachi, and Mitsuo Taguchi, Iwaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,487
Claims priority, application Japan, Jan. 11, 1982, 57-1805
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—412 **16 Claims**



1. In a gas detection device having an electrolytic cell including a working electrode, a counter electrode and a reference electrode, with one surface of each of the working elec-

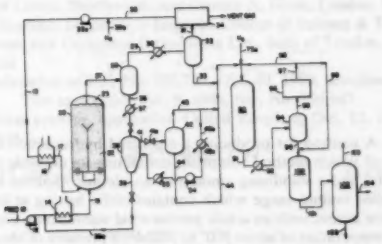
trode, counter electrode and reference electrode being kept in contact with an electrolyte, and another surface of each of the working electrode, the counter electrode and the reference electrode being exposed to an environmental gas, circuit means for electrically connecting said working electrode and said counter electrode to take out electric current due to electrochemical reaction, and means for applying a predetermined voltage between said working electrode and said reference electrode to detect carbon monoxide gas and/or hydrogen gas in the environmental gas, and further including means for suppressing the arrival of the environmental gas at said working electrode so that the sensitivity of said working electrode is made smaller than that of said reference electrode.

4,478,705

HYDROCONVERSION PROCESS FOR HYDROCARBON LIQUIDS USING SUPERCRITICAL VAPOR EXTRACTION OF LIQUID FRACTIONS

Partha S. Ganguli, Lawrenceville, N.J., assignor to HRI, Inc., Gibbsboro, N.J.

Filed Feb. 22, 1983, Ser. No. 468,108
Int. Cl.³ C10G *65/10*
U.S. Cl. 208—59 **7 Claims**



1. A process for high hydroconversion of heavy hydrocarbon liquid feedstock containing at least about 50 V % material normally boiling above about 975° F. to produce lower boiling hydrocarbon liquid and gas products wherein Ramsbottom carbon residue (RCR) materials and metals-containing compounds are removed from the liquid fraction by supercritical solvent vapor extraction, said process comprising:

(a) feeding said hydrocarbon liquid feedstock together with hydrogen into a reaction zone, said reaction zone being maintained at 780°–860° F. temperature and 1000–5000 psig hydrogen partial pressure for liquid phase hydroconversion reaction to provide a hydroconverted effluent material containing a mixture of gas and liquid fractions;

(b) separating said hydrocarbon effluent material in a first separation zone into a gas fraction and a liquid fraction;

(c) draining said liquid fraction to a second separation zone maintained at a temperature 50°–150° F. above that in the first separation zone so as to vaporize a solvent fraction and form a supercritical solvent vapor therein to dissolve and extract the hydrocarbon liquid fraction from the liquid to provide substantial separation of the RCR material and metals-containing compound residue from a remaining extracted vapor therein;

(d) withdrawing said residue along with a minor portion of high boiling residual oil from said second separation zone;

(e) withdrawing and pressure-reducing the remaining extracted vapor from said second separation zone containing supercritical solvent vapor and dissolved liquid, and separating a light solvent fraction from a remaining heavy liquid fraction; and

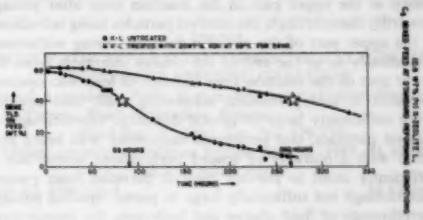
(f) withdrawing hydrocarbon liquid and gas products from the process.

4,478,706

ZEOLITE L CATALYST FOR REFORMING

Abraham D. Cohen, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 426,211, Sep. 28, 1982, Pat. No. 4,448,891. This application Feb. 6, 1984, Ser. No. 577,242
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—138 **18 Claims**



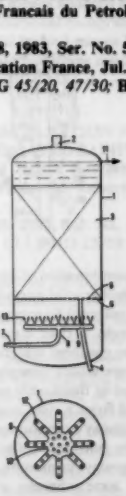
1. A reforming process for producing aromatic hydrocarbons from a hydrocarbon feedstock containing paraffins of at least C_6 comprising: contacting the hydrocarbon feedstock plus added hydrogen at elevated temperatures with a catalyst which comprises a zeolite having exchangeable cations of which at least 90% are metal ions selected from the group consisting of sodium, lithium, potassium, rubidium, barium and cesium and containing at least one metal selected from the group consisting of Group VIII of the periodic table of elements and having a dehydrocyclizing effect, said zeolite produced by soaking a type L zeolite prior to calcining the dehydrocyclizing metal loaded zeolite in an alkali solution having a pH of at least 11 for a time and at a temperature effective to increase the period of time over which the catalytic activity of the catalyst is maintained under reforming conditions.

4,478,707

PROCESS FOR THE HYDROTREATMENT OF HYDROCARBONS IN AN EXPANDED OR EBULLATED CATALYST BED

Didier Bischoff; Gerard Courteheuse, both of Rueil Malmaison, and Pierre Renard, Saint Nom la Breteche, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 8, 1983, Ser. No. 512,050
Claims priority, application France, Jul. 9, 1982, 82 12239
Int. Cl.³ C10G *45/20, 47/30;* B01J *8/22*
U.S. Cl. 208—157 **13 Claims**



1. In a process for the hydrotreatment, hydrovisbreaking or hydroconversion of hydrocarbons, wherein a liquid hydrocar-

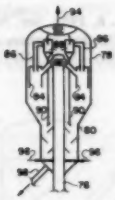
bon charge and a hydrogen-containing gas are contacted with a solid catalyst, in a reaction zone having substantially the shape of an elongate, substantially vertical volume of revolution, containing the catalyst and having a perforated wall at its lower end which supports the catalyst bed, at least a part of the liquid charge and the hydrogen-containing gas being introduced into the lower part of the reaction zone below said perforated wall, the liquid and gaseous effluent being withdrawn at the upper part of the reaction zone after passage upwardly therethrough, the catalyst particles being introduced at the upper part of the reaction zone and being withdrawn periodically or at the end of the charge treatment from the lower part of the reaction zone through at least one opening provided in said perforated supporting wall, said opening being sufficiently large to permit discharge therethrough of catalyst particles, said perforated supporting wall being provided with a plurality of spaced perforations whose size is sufficiently small to prevent catalyst particles from passing therethrough but sufficiently large to permit upward passage therethrough of fluid charge and hydrogen, the improvment wherein said catalyst is in the form of an expanded or ebullated bed, the expansion and/or ebullition thereof being maintained by the passage therethrough of a fluid mixture of charge and hydrogen-containing gas, the liquid charge and hydrogen-containing gas being injected as a fluid mixture, at least a portion of which is injected into the lower part of said reaction zone through at least one distribution zone located below said perforated support wall, said wall being substantially horizontal, each said distribution zone comprising a distribution ramp terminating in a substantially vertical injection pipe and feeding a plurality of radial branches in a star-shaped array, each branch being provided with a plurality of orifices wherethrough a portion of said fluid mixture is injected into said reaction zone.

4,478,708

METHOD AND APPARATUS FOR SEPARATING FLUIDIZED SOLID PARTICLES SUSPENDED IN GASIFORM MATERIAL

Carl D. Farnsworth, 2401 Sedley Rd., Charlotte, N.C. 28211

Filed Oct. 11, 1983, Ser. No. 540,359
Int. Cl.[3] C10G *11/18*; F27B *1/20*
U.S. Cl. 208—161 **14 Claims**



1. In a processing combination of hydrocarbon conversion in the presence of fluidizable solid particle material and regeneration of solid particle material to remove carbonaceous deposits by combustion wherein a riser zone is employed to pass a suspension of solids in gasiform material upwardly through the riser the improvements which comprises,

passing a suspension of fluidizable solids in gasiform material radially outward from a riser contact zone by a confined open end passageway communicating with a cylinderical zone open in the bottom on the outer end thereof, said confined passageway communicating tangentially with said cylindrical zone whereby a suspension of solids in gasiform material is separated by centrifugal momentum differential within said cylindrical zone to form a compact centrifugal flowing mass of solids separated from gasiform material collected in a central portion of said cylindrical zone,

discharging said compact flowing mass of solids from the open bottom of said cylindrical zone in counter current contact with upwardly flowing stripping gas passing upwardly into the bottom portion of said cylindrical zone and,

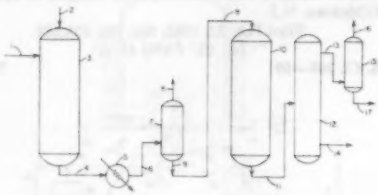
withdrawing gasiform material upwardly from within said cylindrical zone separated from particle material for recovery as products of the separation combination.

4,478,709

PROCESS FOR STABILIZING DEWAXED DISTILLATE OILS

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,306
Int. Cl.[3] C10G *69/00, 55/06, 69/06*
U.S. Cl. 208—257 **16 Claims**



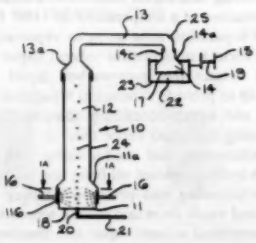
1. A method for producing a stabilized hydrocarbon distillate oil which method comprises contacting an unstable distillate oil and a stabilizing amount of an olefinic naphtha in the gasoline boiling range which contains olefin having at least 4 carbon atoms, with an acidic porous solid stabilization catalyst at a temperature of about 300° to 500° F., a pressure of about 50 to 500 psig, and a liquid hourly space velocity of about 0.25 to 5.0 LHSV, provided that wherein said olefinic naphtha is obtained by catalytically dewaxing a wax-containing distillate oil by contacting said oil with a zeolite dewaxing catalyst, said zeolite dewaxing catalyst has a silica to alumina mole ratio ranging from about 12 to 200.

4,478,710

SEPARATION METHOD AND APPARATUS

Alvin J. M. Smucker, East Lansing; Shawn L. McBurney, Haslett, and Ajit K. Srivastava, East Lansing, all of Mich., assignors to Board of Trustees Operating Michigan State University, East Lansing, Mich.

Filed May 23, 1983, Ser. No. 497,053
Int. Cl.[3] B03D *1/24*
U.S. Cl. 209—17 **14 Claims**



1. An elutriation apparatus for the separation and classification of a heterogeneous mixture of solids including filamentay biological materials and having components with different

specific gravities by means of a liquid and air classification which comprises:

(a) a tubular conduit (**10**) having a vertically oriented longitudinal axis and opposing upper and lower ends along the axis, wherein the lower end is closed;

(b) a tubular transfer tube (**13**) connected to and closing the upper end of the conduit and leading away from the axis of the conduit with an opening from the tube for removing a liquid flowing through the conduit and the tube;

(c) air bubble generating means (**20**) through the lower end of the conduit for providing a flow of air bubbles vertically through the conduit and parallel to the axis and out an air vent hole (**25**);

(d) high kinetic energy generating nozzle means mounted on the conduit (**16***a*) and directed inward at an angle for introducing at least one stream of the liquid inside the conduit adjacent to the air bubble generating means such that the stream is directed inwardly as a high energy vortex around the axis of the conduit; and

(e) classification means (**17**) adjacent to the opening from the tube for collecting the filamentary materials separated from the heterogeneous mixture.

4,478,711

METHOD AND APPARATUS FOR SEPARATING DRY MAGNETIC MATERIAL

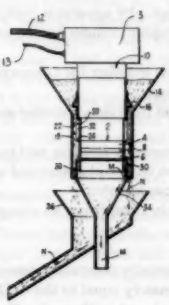
Enrico Cohen, Northwood, and Jeremy A. Good, London, both of England, assignors to Imperial College of Science & Technology and Cryogenic Consultants Ltd., both of London, England

Continuation of Ser. No. 195,789, Oct. 10, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,647

Claims priority, application United Kingdom, Oct. 12, 1979, 7935428

Int. Cl.³ B03C *1/14*

U.S. Cl. 209—39 **14 Claims**



1. A method of separating relatively magnetic particles from relatively non-magnetic particles in a dry state comprising the steps of:

providing an adjustable, substantially vertical, flow of a mixture of the magnetic and non-magnetic particles, the particles moving under at least the influence of gravity, in a three-dimensional stream in a common path adjacent to, and at a predetermined distance away from, a magnet,

producing a uniform strong magnetic field force with said magnet having a radial component produced over a relatively short proportion of said path of the particles, said radial component greatly exceeding an axial component of the magnetic field force, and said axial component exerting a force which is less than that of gravity, said path being a predetermined distance away from the magnet in a direction of said radial component of the magnetic field force, so that magnetic particles in said mixture of particles are diverted from said path toward said magnet but are not retained by it while particles in said mixture of particles not diverted toward said magnet continue in said path, and

separating particles in said mixture of particles not diverted from said path toward said magnet from magnetic particles in said mixture of particles diverted from said path toward said magnet with a splitter located adjacent to said path of the particles below said relatively short proportion of said path over which said radial component of the magnetic field force is produced.

4,478,712

DEVICE FOR SEPARATING IMMISCIBLE FLUIDS OF DIFFERENT SPECIFIC GRAVITIES

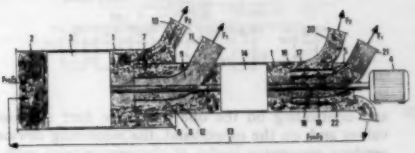
Marcel Arnaudeau, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 30, 1982, Ser. No. 429,576

Claims priority, application France, Sep. 30, 1981, 81 18580

Int. Cl.³ B01D *43/00*

U.S. Cl. 210—96.1 **14 Claims**



1. In a device for separating the components of a mixture of at least two immiscible fluids of different specific gravities, this device comprising inlet means connected to a tubular body provided with at least one coaxial internal partition for introducing said mixture at a first end of said tubular body, and respective extraction means connected to said tubular body for discharging, separately, at least partly said mixture, one of said at least two immiscible fluids, and another of said at least two immiscible fluids at the second end of the tubular body, first means adapted for imparting to said mixture when flowing through said body, a motion having a rotational component about the axis of the tubular body and feedback means for feeding back the stream, issuing from the second end, to said inlet means, the improvement wherein said device further comprises at least second means adapted to impart to the fluid passing therethrough a rotational component about the axis of the tubular body with said second means located downstream from the end of one of said partitions inside said tubular body.

4,478,713

AUTOMATIC INSTALLATION FOR LIQUID CHROMATOGRAPHY

Pierre Girot, Paris, and Egisto Boschetti, Chatou, both of France, assignors to Pharmuka Laboratoires, Gennevilliers, France

Filed Sep. 23, 1983, Ser. No. 535,308

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—101 **12 Claims**

1. An automatic installation for liquid chromatography, of the type comprising a chromatographic column, a container of the product to be fractionated, and at least one container of eluent, said containers being connectable with the top of the column via an injection pump, detection means connected to the output of the column and supplying at least one measuring signal representing a characteristic of the liquid discharged from the bottom of the column, means for collecting fractions with at least one collector container which is connectable with the base of the column via an automatically-controlled output valve, and a control unit receiving the measuring signal and comprising means for controlling the fractions collecting means, wherein:

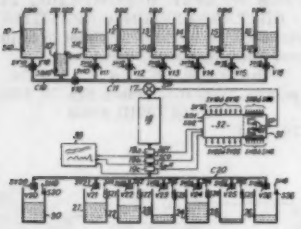
a level detector is provided for each container of product to

be fractionated and of eluent, which detector produces a low level signal whenever the level of the liquid inside the container is below a predetermined threshold,

automatically controlled feed valves are mounted between the injection pump and each container of product to be fractionated and eluent, respectively,

a measuring device is provided for the container of the liquid to be fractionated, to allow injection into the column of a pre-determined quantity of said product, and

the control unit comprises: a control device receiving the or each measuring signal produced by the detection means



and controlling on the one hand, the feed and output valves and, on the other hand, the measuring device, to produce successive cycles of chromatography each one including at least the consecutive operations of injecting into the column a set quantity of the product to be fractionated, of admitting in the eluent, and of collecting a fraction; and a safety device connected to the level detectors to control the stoppage of the pump and prevent admission of product to be fractionated or of eluent into the column when the corresponding level detector produces a low-level signal.

4,478,714

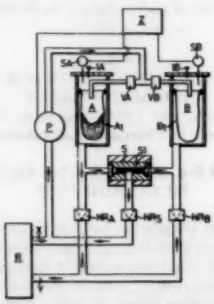
PRESSURIZED FILTRATION SYSTEM

Colin C. Blake, Rochford; Charles C. O. Goodall, Ilford, and Paul A. Bacon, Hornchurch, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 10, 1983, Ser. No. 456,871

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—136 **7 Claims**



1. A pressurized filtration system for removing suspended solids from a liquid which comprises two enclosed filter vessels each containing either a removable filter bag or cartridge, the vessels being located in parallel in the circulation line of a pump which pumps the liquid from a bulk storage vessel through only one filter vessel at a time, this being controlled by a valve system in the circulation line to the filter vessels, liquid forced through the filter vessel in use being pumped to a liquid storage vessel via a non-return valve located in the outlet line from each vessel, the outlet from each vessel having a branch connection to a shuttle valve, the outlet from which is connected via a non-return valve to the suction side of a pump whereby when liquid is being pumped through one vessel the shuttle valve is shut against the flow of liquid therethrough but is open on the other side so that liquid can be sucked out of the other vessel.

4,478,715

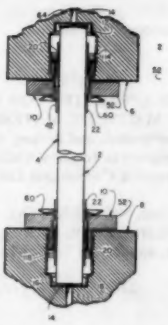
COLUMN RETAINER

Lyman E. Goodnight, Jr., North Palm Beach, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Nov. 2, 1983, Ser. No. 547,977

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **4 Claims**



1. Liquid chromatography apparatus comprising:

a liquid chromatographic column having an inlet end and an outlet end,

an external fluid flow member for connection to one of said ends of said column,

a gasket between said fluid flow member and said one end of said column, and

a column retainer assembly holding said column in pressure sealed engagement with said gasket and said gasket in turn with said fluid flow member,

said retainer assembly comprising an elongated collet and a collet nut,

said collet having:

a lumen of substantially constant diameter throughout its length approximately equal to the O.D. of said column,

a tapered proximal end with a plurality of longitudinal slots therein,

an extended distal end,

a central body portion integral with said distal end and said proximal end, and

external threads on said central body portion, said collet nut having:

a distal end internally threaded to mate with said external threads of said collet,

a proximal end with a first lumen of diameter approximately equal to the O.D. of said column,

a second lumen distal of said first lumen of diameter larger than said first lumen, and

a internal tapered portion joining said first lumen to said second lumen,

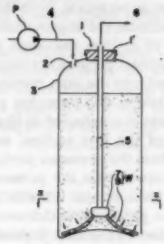
said column extending through said lumens of said collet and said collet nut and said collet nut is threaded into said collet to force said collet tapered proximal end into said collet nut internal tapered portion clamping said collet proximal end onto the outside of said column.

4,478,716

MIXED-BED DEVICE FOR PRODUCING PURE WATER

Tsuneo Hasegawa, Shimouchikawa; Kiyoharu Nakahara, Nara, and Seitaro Hasegawa, Ibaragi, all of Japan, assignors to Seisu Kogyo Co., Ltd., Japan

Filed Jan. 17, 1983, Ser. No. 458,284
Claims priority, application Japan, Mar. 2, 1982, 57-33186
Int. Cl.[3] B01D *15/04*
U.S. Cl. 210—289 3 Claims



1. In a mixed-bed device for producing pure water, said device comprising a tubular container, a closure member, a water collecting tube and a water collector having a plurality of apertures, wherein said tubular container has a bottom wall, a cylindrical body portion and a domed upper portion, said domed upper portion of said c ntainer has a water supply inlet and a constricted opening formed therein, said closure member is removably inserted in said constricted opening, said water collecting tube extends into said container through said closure member such that an end of said water collecting tube is disposed proximate said bottom wall of said container, and said water collector is attached to said end of said water collecting tube, the improvement comprising said water collector being expandable from a relatively narrow configuration, wherein said water collector is insertable into said container through said constricted opening in said domed portion, to a relatively wide configuration, wherein said water collector has a width substantially equal in size to the inner diameter of said cylindrical body portion of said container, and wherein said expandable water collector comprises a header and a plurality of flexible tubular members, each of said flexible tubular members protrudes from a wall of said header, said flexible tubular members are substantially evenly spaced-apart, said flexible tubular members are in fluid communication with said header, and each of said flexible tubular members comprises a plurality of substantially rigid tube segments and a plurality of flexible tube segments, said flexible tube segments interconnecting said rigid tube segments.

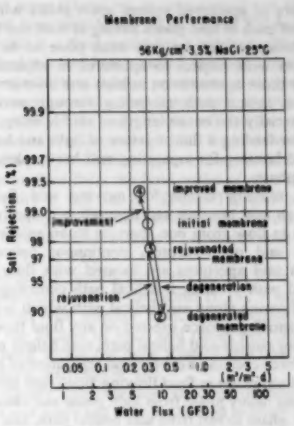
4,478,717

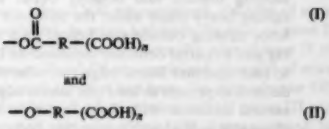
SEMIPERMEABLE MEMBRANE TREATED WITH MODIFIED VINYL POLYMER

Masaru Kurihara; Noriho Harumiya, both of Ohtsu, and Tadahiro Uemura, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 177,239, Aug. 11, 1980, abandoned.
This application May 27, 1982, Ser. No. 382,566
Int. Cl.[3] B01D *31/00*
U.S. Cl. 210—500.2 23 Claims

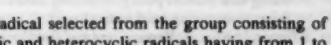
1. A semipermeable membrane for liquid separation, having a structure which is permeable to liquid, and having improved rejection performance, in which the semipermeable membrane has attached thereto an effective amount of a modified vinyl polymer having a main vinyl chain and an acetoxy side group bonded to the main vinyl chain and at least one other side group, bonded to the main vinyl chain, selected from the group consisting of groups represented by Formula (I) and (II) as follows:





(I)

and



(II)

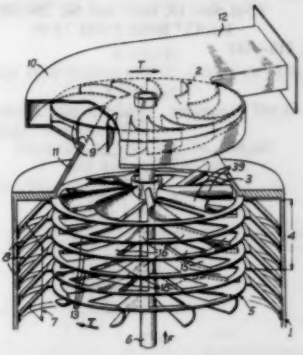
wherein R is a radical selected from the group consisting of aliphatic, aromatic and heterocyclic radicals having from 1 to 9 carbon atoms, and n is an integer from 1 to 3.

4,478,718

CENTRIFUGAL SEPARATION APPARATUS

Pierre Saget, 36 Avenue de La Grande Armee, 75017 Paris, France

Continuation-in-part of Ser. No. 199,863, Oct. 23, 1980, Pat. No. 4,361,490. This application Aug. 4, 1982, Ser. No. 405,745
Claims priority, application France, Oct. 31, 1979, 79 27079
The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.
Int. Cl.[3] B01D *45/00*
U.S. Cl. 210—512.3 6 Claims



1. A centrifugal separating apparatus for separating a heavy phase from a light phase in a fluid mixture of such phases comprising:

a housing having an outlet;

a plurality of apertured spaced apart plates with the apertures of each of said plates having at least one lateral edge and being located on said each plate to be positioned thereon with respect to apertures in adjacent plates to locate those apertures on at least one uninterrupted, continuous helical path extending through said plates for substantially the entire length of said housing;

means for feeding a fluid mixture of light and heavy phases to said housing for separating said heavy phase from said light phase;

mixture moving means for moving said fluid mixture through said housing and through said apertures of said plates to flow from one aperture to an adjacent aperture along said uninterrupted, continuous helical path on which said apertures are located with flow along said helical path creating a helical path centrifugal force on fluid flowing along said helical path which is in excess of any centrifugal force exerted on any fluid flowing in said housing outside said helical path, said helical path centrifugal force creating a centrifugal separation of heavy phase from light phase in fluid flowing along said helical path to separate heavy phase from light phase and cause separated heavy phase to exit from said helical path, said plates each having means for contacting heavy phase exiting said helical path and preventing such exiting heavy phase from moving toward said housing outlet and guiding such exiting heavy phase under the influence of the centrifugal force existing outside said helical path toward said housing and a central deflector mounted on the plates adjacent to each aperture lateral edge and wherein each opening is defined to present at least one lateral edge extended by the central defector with fluid forces in the fluid flowing along said helical path preventing said exiting heavy phase from re-entering said helical path;

a heavy phase collecting means fluidly connected to said housing to collect said exiting heavy phase guided thereto by said plates and the centrifugal force exerted on fluid located outside said helical path; and

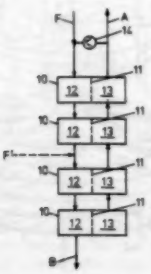
a light phase discharge means fluidly connected to said helical path to collect light phase which has followed said helical path through said plates.

4,478,719

METHOD AND APPARATUS FOR THE SEPARATION OF FLUIDS BY PERMEATION

Helmut Michele, Auf dem Schnee 2c, 5804 Herdecke; Günter Schulz, Rosental 38-40, 4600 Dortmund 1, and Udo Werner, Halerner Strasse 67, 4350 Recklinghausen, all of Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,335
Int. Cl.³ B01D *31/00, 13/00*
U.S. Cl. 210—641 **15 Claims**



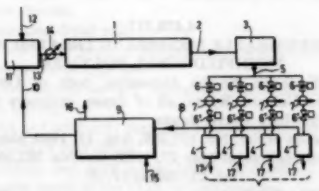
15. In a method for separating a fluid by permeation in at least three permeation sections, which are first, second and third permeation sections, each section being composed of at least one permeation stage which is provided with a wall differently permeable for the fluid or its components, each stage being divided by the wall into an inlet portion and a permeate portion, according to which method fluid to be separated is introduced into the inlet portion of a stage of the first section to flow along the wall of that stage while a more readily permeating component of the fluid passes through the wall and into the permeate portion of that stage, and fluid in the permeate portion of that stage flows along the wall in countercurrent to the fluid in the inlet portion of that stage, and fluid is withdrawn, as permeate, from the permeate portion of a stage of the first section, the improvement wherein the first section is composed of at least two such permeation stages, which are first and second permeation stages, the fluid to be separated is introduced into the inlet portion of the first stage of the first section, fluid in the permeate portion of the first stage of the first section is conducted to the permeate portion of the second stage of the first section, and the fluid withdrawn, as permeate, from the permeate portion of a stage of the first section is withdrawn from the permeate portion of the second stage of that section, and wherein said method comprises: conducting the permeate withdrawn from the second stage of the first section to the inlet portion of a stage of the second permeation section to flow along a wall of that stage while a more readily permeating component thereof passes through the wall and into the permeate portion of the stage of the second permeation section; conducting fluid from the inlet portion of the stage of the second permeation section to the inlet portion of the second stage of the first permeation section and from the inlet portion of the second stage of the first section to the inlet portion of the first stage of the first section; withdrawing fluid from the permeate portion of the stage of the second permeation section and conducting that fluid to the inlet portion of the stage of the third permeation section to flow along the wall of that stage while a more readily permeating portion thereof passes through the wall and into the permeate portion of that stage of the third permeation section; withdrawing fluid from the permeate portion of the stage of the third permeation section; and conducting fluid from the inlet portion of the stage of the third permeation section to the inlet portion of the stage of the second permeation section.

4,478,720

FRACTIONATION PROCESS FOR MIXTURES BY ELUTION CHROMATOGRAPHY WITH LIQUID IN SUPERCRITICAL STATE AND INSTALLATION FOR ITS OPERATION

Michel Perrut, St Nicolas de Port, France, assignor to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed May 31, 1983, Ser. No. 499,597
Claims priority, application France, Jun. 3, 1982, 82 09649
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—659 **14 Claims**



1. A process for fractionating a mixture by supercritical fluid elution chromatography, said process comprising the steps of:

(a) continuously feeding an eluent fluid in the supercritical state at a constant flow rate through an elution chromatography column;

(b) periodically injecting an amount of a mixture to be fractionated into the supercritical eluent fluid at the head of the elution chromatography column;

(c) detecting the emergence of fractions of said mixture in

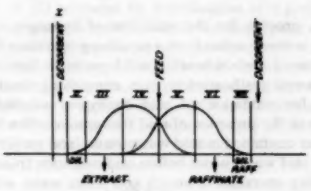
the supercritical eluent stream emerging from the elution chromatography column;
(d) selectively directing portions of said supercritical eluent stream containing detected fractions of said mixture to individual separators of a bank of parallel separators;
(e) separating mixture components from each eluent portion by allowing the supercritical eluent of each portion to expand in the separator to which it was directed;
(f) withdrawing separated mixture components from the bottom of each separator;
(g) withdrawing gaseous eluent from the top of each separator;
(h) purifying the withdrawn eluent;
restoring the purified eluent to the supercritical state, and
(j) recycling the supercritical eluent from step (i) to step (a) such that the quantity of eluent present in the circuit of steps (a) through (j) is maintained constant.

4,478,721

HIGH EFFICIENCY CONTINUOUS SEPARATION PROCESS

Clarence G. Gerhold, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 407,680, Aug. 12, 1982, Pat. No. 4,402,832. This application Jul. 29, 1983, Ser. No. 518,579
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—659 **20 Claims**



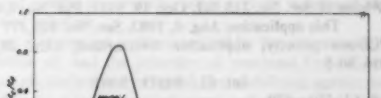
1. A process for separating an extract component from a raffinate component contained in a feed mixture comprising the steps of:
(a) maintaining a unidirectional fluid flow system through a series of separating units in which said components have differential rates of travel due to selective retardation or acceleration of each of said components in each of said units, each of said units having a fluid inlet and a fluid outlet;
(b) continuously passing said feed mixture into one of said fluid inlets and a displacement fluid into another of said fluid inlets, said displacement fluid being capable of displacing said components from said separating units;
(c) establishing within a system comprising said fluid flow system a component concentration distribution, zones of which comprise, sequentially, the highest purity displacement fluid (zone I), extract component diluted with displacement fluid (zone II), concentrated extract component (zone III), extract and raffinate component mixture with the extract component being the major component (zone IV), extract and raffinate component mixture with the raffinate component being the major component (zone V), concentrated raffinate component (zone VI), and raffinate component diluted with displacement fluid (zone VII), certain of said zones being combinable to obtain one or two of the pairs of zones II and III or III and IV, and V and VI or VI and VII, whereby each pair is considered as one continuous zone, each zone may comprise part of only one pair, each of said zones II, IV, V and VII having associated with it, unless paired with another zone, one of said fluid inlets and one of said fluid outlets, zone I having the fluid inlet for displacement fluid associated with it, and each of zones III and VI, or zone pairs II and III or III and IV, and zone pairs V and VI or VI and VII having associated with it a fluid outlet for a product effluent stream, said feed mixture being passed through a fluid inlet, the locus of which is at least proximate to the point on said component concentration distribution where the relative proportions of the extract and raffinate components are the same as that occurring in the feed mixture;
(d) continuously withdrawing an extract stream comprising the entire flow from the fluid outlet of zone III or one of zone pairs II and III or III and IV, and continuously withdrawing a raffinate stream comprising the entire flow from the fluid outlet of zone VI or one of zone pairs V and VI or VI and VII;
(e) continuously passing the entire stream from each of the fluid outlets of each of said zones II, IV, V and VII, if not combined with another zone, to a corresponding fluid inlet, the locuses of each said outlet and corresponding inlet beng within the same zone of said component concentration distribution; and,
(f) periodically simultaneously effecting the following shifting of said inlets and outlets: the feed mixture fluid inlet to what prior to the shift was the inlet of zone V or zone VII if zones V and VI are combined, the inlet of zone V, if uncombined, to what had been the inlet of zone VII or zone I if zones VI and VII are combined, the inlet of zone VII, if uncombined, to what had been the inlet of zone I, the inlet of zone I to what had been the inlet of zone II or zone IV if zones II and III are combined, the inlet of zone II, if uncombined, to what had been the inlet of zone IV, or to what had been the feed mixture inlet if zones III and IV are combined, the inlet of zone IV, if uncombined, to what had been the feed mixture inlet, the outlet of zone II, if uncombined, to what had been the outlet of zone III, or zone pair III and IV, the outlet of zone III or zone pair II and III to what had been the outlet of zone IV, if uncombined, the outlet of zone IV or zone pair III and IV to what had been the outlet of zone V or zone pair V and VI, the outlet of zone V, if uncombined, to what had been the outlet of zone VI or zone pair VI and VII, and the outlet of zone VI or zone pair V and VI to what had been the outlet of zone VII, if uncombined, and the outlet of zone VII or zone pair VI and VII, to what had been the outlet of zone II or zone pair II and III, said shifting being effected prior to the progression through said units of said component concentration distribution to the extent that the composition of the inlet or outlet streams to or from any zone or zone pair becomes inconsistent with the desired composition of that zone or zone pair.

4,478,722

PROCESS FOR SEPARATING SALTS IN AQUEOUS STREAMS

W. Steven Boom, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1983, Ser. No. 538,887
Int. Cl.³ B01D *15/04*
U.S. Cl. 210—672 **6 Claims**



1. In a process for separating two or more salts comprising contacting an aqueous solution containing said salts with an ion retardation resin and then eluting the resin to recover a first

eluant fraction which is rich in a first salt and at least one subsequent eluant fraction which is rich in another salt, the improvement comprising employing as the ion retardation resin a porous polymeric particulate containing a plurality of strong base groups which are in association with weak acid groups and a plurality of excess strong base groups which are not in association with weak acid groups, which excess strong base groups have associated therewith a counterion which is an anion for which the strong base group has less affinity than for the anion of the salt which appears in said subsequent eluant fraction.

4,478,723

ADSORPTIVE SEPARATION METHOD

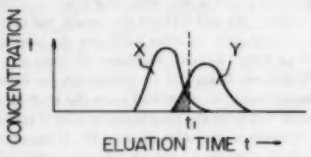
Masatoshi Tanouchi, Arcadia, Calif., and Hirshumi Akiyama, Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1982, Ser. No. 383,692

Claims priority, application Japan, Jun. 15, 1981, 56-90841; Jun. 15, 1981, 56-90840; Jul. 31, 1981, 56-119321; Sep. 2, 1981, 56-137071

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—674 **14 Claims**



1. An adsorptive separation method comprising alternately supplying a starting mixture A which is a mixture of organic substances and a desorbent into a column packed with an adsorbent, treating to form and move an adsorption band of the starting mixture A and recovering the intended component at a purity higher than the aimed purity from an eluate, wherein after the entire amount of the intended component passing through the column is increased over the amount of the intended component in the starting mixture A and the intended component is separated and recovered, a portion B which is at least a part of the remaining intended component-containing portion and in which the desorbent is separated and removed to a concentration lower than the desorbent concentration in the starting mixture A and the intended component is contained at a concentration higher than the concentration of the intended component in the starting mixture A is mixed with the starting mixture A and supplied to the column or said portion B and the starting mixture A are successively supplied to the column one by one, and then, the desorbent is supplied.

4,478,724

CATIONIC ADSORPTION AGENT

Jaroslav Hasse, Riehen, and Roger Palmberg, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 313,061, Oct. 19, 1981, Pat. No. 4,424,284. This application Aug. 4, 1983, Ser. No. 520,377

Claims priority, application Switzerland, Oct. 28, 1980, 8016/80-5

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—679 **6 Claims**

1. A process for the removal of anionic substances from aqueous solutions, which process comprises contacting said solutions with a cationic adsorption agent which has been obtained by reaction of

(a) an amino compound which contains at least one amino group and at least one free or methylolated carbamide or thiocarbamide group, or a salt thereof, with

(b) an aminoplast precondensate which does not contain amino groups.

4,478,725

PROCESS FOR THE OXIDATION OF HYDROGEN SULPHIDE DISSOLVED IN THE WASTE WATER FROM A COAL GASIFICATION PROCESS

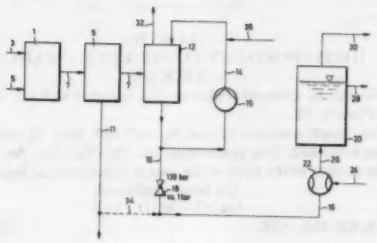
Günther Velling, Bornheim, and Norbert Brüngel, Cologne, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Fed. Rep. of Germany

Filed Mar. 18, 1983, Ser. No. 476,574

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209856

Int. Cl.³ C02F *1/72*

U.S. Cl. 210—703 **8 Claims**



1. A process for the oxidation of hydrogen sulphide dissolved in waste water from a scrubbing operation for removing fine-grained carbon-bearing solid particles from the product gas of a coal gasification process, comprising treating the waste water for oxidation of said hydrogen sulphide dissolved therein in the presence of said fine-grain carbon bearing solid particles contained in said waste water, and recycling at least a part of said waste water before said oxidation treatment to said scrubbing operation to enrich said waste water with said solid carbonaceous particles.

4,478,726

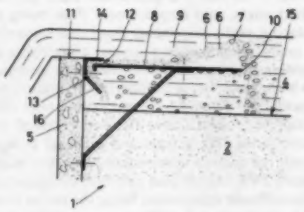
PARTICULATE FILTER BACKWASH OUTLET

Richard P. Moore, Germiston, South Africa, assignor to Blue Circle Projects (Proprietary) Limited, Germiston, South Africa

Filed Oct. 26, 1982, Ser. No. 436,740

Int. Cl.³ B01D *23/24*

U.S. Cl. 210—793 **8 Claims**



1. A method of preventing loss of filter media during backwashing of a liquid particle filter by passing a backwashing fluid in an upward direction through the filter which comprises the steps of: directing the backwash fluid and entrained filter media along a deflection plate which defines a horizontal zone wherein substantially non-turbulent flow takes place which flow extends between a space above the filter media bed and a backwash outlet; allowing entrained media to settle onto the

deflection plate in the zone while it is carried by the velocity of the fluid in the zone; trapping this media near an outlet for the backwash fluid from the filter; passing the entrapped media through a return passage back into the filter bed; and, shielding the return passage from the ingress of upwardly flowing backwash fluid.

4,478,727

SODIUM STYRENE SULFONATE-CO-SODIUM-N-(4-SULFOPHENYL)-MALEIMIDE- AN IMPROVED VISCOSITY CONTROL ADDITIVE

S. Richard Turner, Bridgewater, N.J.; Thad O. Walker, Humble, Tex., and Warren A. Thaler, Aberdeen, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 13, 1982, Ser. No. 416,939
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 C 5 Claims

1. A water-based drilling mud which comprises:

(a) water;

(b) about 4 to about 30 lbs/bbl. of a clay;

(c) about 1 to about 30 lbs/bbl of a lignosulfonate;

(d) weighting material of sufficent quantity necessary to achieve the desired density;

(e) about 0.25 to about 5 lbs/bbl. of a sodium styrene sulfonate co-sodium-N-(4-sulfophenyl)-maleimide copolymer, said copolymer being (1) prepared by copolymerization of sodium styrene sulfonate and sodium-N-(4-sulfophenyl)-maleimide and having an $\overline{Mn}$ of about 10,000 to about 100,000, or (2) prepared by modification of a preformed alternating styrene/maleic anhydride copolymer by sequentially sulfonating the styrene pendant unit with SO_3 followed by addition of sulfanilic acid to the enchained succinic anhydride units, said preformed copolymer having a molecular weight of from 1,000 to 500,000; and

(f) base of sufficient quantity to adjust the pH of the water-based drilling mud to about 10 to about 10.5.

4,478,728

PROCESS AND COMPOSITIONS FOR PRESERVING FRESH HIDES AND SKINS

William J. Hopkins; Paula C. Sweeney, both of Philadelphia, and David G. Bailey, Warminster, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 356,865, Mar. 15, 1982, Pat. No. 4,424,059. This application Oct. 20, 1983, Ser. No. 543,730
Int. Cl.³ C14C 9/00, 1/04
U.S. Cl. 252—8.57 2 Claims

1. A composition for preserving fresh animal hides comprising a fresh hide preservative effective amount of butyl carbitol as a concentration of 2.0% based on the weight of the hide, water, an acid selected from the group consisting of formic acid, sodium bisulfate, acetic acid, and proprionic acid, and the surface active agent tergitol 15-S-9.

4,478,729

MOLYBDENUM SULFONATES FOR FRICTION REDUCING ADDITIVES

Mack W. Hunt, and Charles T. West, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 14, 1982, Ser. No. 388,047
Int. Cl.³ C10M 1/38, 1/54
U.S. Cl. 252—33.2 11 Claims

1. An oil soluble lubricating oil composition comprising a sulfurized molybdenum sulfonate in a lubricating oil, wherein said molybdenum sulfonate is the sulfurized reaction product of molybdenum halide and a hydrocarbyl sulfonic acid compound, the reaction product of molybdenum halide and a hydrocarbyl sulfonic acid compound having been prepared by reacting said molybdenum halide with said hydrocarbyl sulfonic acid compound at a temperature within the range of 30° F. to 300° F.

4,478,730

BOWLING LANE OIL COMPOSITION

Robert J. O'Connor, Palo Alto, Calif., assignor to Cedric P. Spellman, Pleasanton, Calif.

Filed Apr. 1, 1983, Ser. No. 481,367
Int. Cl.³ C10M 1/32
U.S. Cl. 252—34.7 7 Claims

1. An oil composition for use on bowling alleys consisting essentially of:

a major amount of an oil component,

from 0.125 to 5 percent by wt quaternary ammonium compound,

a leveling agent in an amount sufficient to facilitate leveling of the oil over the bowling alley, and

a coupler in an amount sufficient to cause the components of said composition to go into solution with one another.

4,478,731

AQUEOUS LUBRICATING COMPOSITION AND PROCESS OF MANUFACTURING SAME

Antoine Gaucher, Saint Etienne, France, assignor to Centre Stephanois De Recherches Mecaniques Hydromecanique Et Frottement Zone Industrielle, Boutheon-Loire, France

Continuation of Ser. No. 073,803, Sep. 10, 1979, abandoned. This application Jul. 21, 1983, Ser. No. 516,182
Claims priority, application France, Sep. 8, 1978, 78 26376
Int. Cl.³ C10M 3/18
U.S. Cl. 252—36 20 Claims

1. A process for the production of an aqueous lubricant composition comprising the steps of:

creating a first mother solution comprising an aqueous solution of at least one alkali metal carboxylate which is water soluble, wherein the anionic moiety of said alkali metal carboxylate comprises a saturated linear organic radical having at least twelve carbon atoms;

creating a second mother solution comprising an aqueous solution of at least one metallic salt, wherein the anionic moiety of said metallic salt is selected from the group consisting of hydroxide, chloride, sulphate, nitate and phosphate ions, and wherein the cationic moiety of said metallic salt is selected from the group consisting of bivalent and trivalent metal ions having an electro-chemical oxidation-reduction potential greater than about −0.7 volts;

mixing said first and second mother solutions together to form a mixture thereof; and

heating said mixture to a temperature of between about forty degrees centigrade and about seventy degrees centigrade;

wherein the concentration and volume of said first solution are selected so as to provide a stoichiometric excess of carboxylate in said mixture, relative to the concentration of said at least one metallic salt in a given volume of said second solution;

wherein said process is characterized by the absence of the addition of, and the selection of reactants free of, any other oil, surface active agents, and stabilizing agents; and

wherein said at least one alkali metal carboxylate and said at least one metallic salt are selected so that the metallic carboxylate so formed does not precipitate from said mixture;

whereby a stable aqueous lubricant composition comprising water and at least one metallic carboxylate, free of added oil, surface active agents, and stabilizing agents, is provided.

4,478,732
FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 20, 1981, Ser. No. 265,301
The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.
Int. Cl.³ C10M *1/54, 1/10*
U.S. Cl. 252—49.6 **10 Claims**

1. A improved lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor effective amount of a multifunctional additive having improved friction reducing, oxidative and thermal stability, anti-rust and anti-corrosion properties and wherein said additive is selected from the group consisting essentially of borated mixed hydroxylalkyl or hydroxyalkenyl hydrocarbyl imidazolines-hydroxyesters and various combinations of these in which each additive compound has from about 1 to about 30 carbon atoms and is alkyl or substituted alkyl having one or more double bonds and one or more halogen or sulfur atoms and aromatic rings.

4,478,733
DETERGENT COMPOSITIONS

John Oakes, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,593
Claims priority, application United Kingdom, Dec. 17, 1982, 8236005
Int. Cl.³ C11D *3/04*; D06L *3/02*
U.S. Cl. 252—99 **6 Claims**

1. A build detergent bleach composition comprising from 2 to 50% by weight of a surface-active agent selected from the group consisting of organic anionic, nonionic, amphoteric and zwitterionic detergents and mixtures thereof; 4–50% by weight of a peroxide compound bleach; 10–50% by weight of a water-insoluble aluminosilicate cation-exchange material; 3–50% by weight of an alkali-metal orthophosphate; 0–20% by weight of an alkalimetal silicate; and a manganese compound which delivers manganese(II) ions in aqueous solution, in an amount of from 0.005 to 2.5% by weight as manganese (II) metal based on the total detergent composition.

4,478,734
DETERGENT COMPOSITION COMPRISING A MIXTURE OF AN N-ACYLLYSINE AND ANIONIC SURFACE ACTIVE AGENTS, POSSESSING UNIQUE PROPERTIES IN SOFT AND HARD WATER

Keizo Ogino, Tokyo; Masahiro Takehara; Takeshi Miyoshi, both of Fujisawa, and Koichiro Sagawa, Kawasaki, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,669
Claims priority, application Japan, Apr. 2, 1982, 57-55074
Int. Cl.³ C11D *1/10, 7/50*
U.S. Cl. 252—117 **8 Claims**

1. A detergent composition comprising

(a) at least one of N^{ϵ}-long-chain-acyl-N^{α},N^{α}-dimethyllysine of the formula

$$RCONHCH_2CH_2CH_2CH_2CHCOOH$$
$$\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad N(CH_3)_2$$

or N^{ϵ}-long-chain-acyl-N^{α},N^{α},N^{α}-trimethyllysine of the formula

$$RCONHCH_2CH_2CH_2CH_2CHCOO^-$$
$$\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad N(CH_3)_3$$
$$\qquad\qquad\qquad\qquad\quad +$$

or a salt thereof, wherein RCO represents an aliphatic alkanoyl group of carbon number 8–22, and

(b) an anionic surface active agent having a hydrophobic group of carbon number 10 to 18, wherein components (a) and (b) are present at a ratio of 1:9 to 9:1 by weight.

4,478,735
PROCESS FOR PRODUCING GRANULAR DETERGENT COMPOSITION

Mitsuyoshi Yazaki; Hideo Tanaka, and Masayoshi Nakamura, all of Chiba, Japan, assignors to Lion Corporation, Tokyo, Japan

Filed May 11, 1982, Ser. No. 376,963
Claims priority, application Japan, May 20, 1981, 56-76086
Int. Cl.³ C11D *3/04*; B01D *1/16*
U.S. Cl. 252—135 **4 Claims**

1. A process for producing a granular detergent composition containing a surface active agent, a zeolite, an alkali metal silicate, and other detergent builders, the content of the zeolite being 10% through 25% by weight on a dry weight basis, comprising the steps of:

(a) preparing an aqueous slurry having a water content of 45% through 80% by weight and containing, as a dispersing medium, the surface active agent;

(b) bubbling a gas into the aqueous slurry to form a slurry containing bubbles having an average bubble diameter of 40 through 100 microns and having a specific gravity of 0.7 through 0.9;

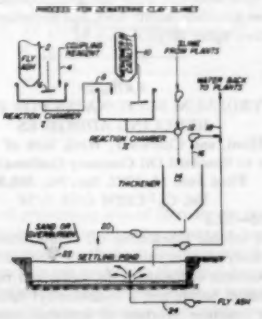
(c) mixing the resultant aqueous slurry with the zeolite, the alkali metal silicate, and the other builders to form a detergent slurry; and

(d) spray drying the detergent slurry to form a granular detergent composition having a bulk density of 0.305 g/cc or less; said process providing a drying capacity of at least about 3800 kg/hr.

4,478,736
COMPOSITION AND PROCESS FOR THE TREATMENT OF CLAY SLIMES

Carl F. Raba, Jr.; Robert L. Smith, and Francis Y. Huang, all of San Antonio, Tex., assignors to Monier Resources, Inc., San Antonio, Tex.

Filed Jan. 14, 1983, Ser. No. 457,930
Int. Cl.³ C02F *1/52, 1/56, 11/14*
U.S. Cl. 252—180 **16 Claims**



1. A composition for the dewatering of clay slimes comprised of:

a. hydrated fly ash;
b. a silane coupling reagent reacted with the hydrated fly ash; and
c. an acrylamide momomer polymerized with the fly ash.

4,478,737

LIQUID OXIDATIVE DESIZING AGENT AND PROCESS FOR OXIDATIVE DESIZING

Klaus Adrian, Frankfurt am Main, and Günter Rösch, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,245

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211677

Int. Cl.³ D06L *1/14*

U.S. Cl. 252—186.25 **2 Claims**

1. Oxidative desizing agent consisting substantially of from 5 to 20 weight % of sodium or ammonium persulfate or potassium, sodium, ammonium or calcium peroxodiphosphate, from 20 to 50 weight % of one or more surfactants selected from the group of C_8–C_{20}-sec.-alkanesulfonates, C_4–C_{12}-alkylphenol-oxethylates having 6 to 12 ethylene oxide moieties, or C_{10}–C_{18}-fatty alcohol-oxethylates having 3 to 8 ethylene oxide moieties, and water in the amount remaining to give 100%.

4,478,738

SELF-RELEASING BINDER BASED ON ISOCYANATE AND THE USE THEREOF IN A PROCESS FOR THE PRODUCTION OF MOLDED ARTICLES

Hans-Joachim Scholl; Hanns I. Sachs, both of Cologne; Gert Jabs, Odenthal, and Günther Loew, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,495

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921689

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—188.31 **6 Claims**

1. A substantially anhydrous binder which has a self-releasing effect for the production of shaped articles comprising:
(A) a polyisocyanate; and
(B) a sulfonic acid having a water content of less than 0.1% by weight and corresponding to the general formula:

$$R—SO_3H)_n$$

wherein
n represents an integer of 1 or 2;
R represents an aromatic hydrocarbon radical having from 6 to 14 carbon atoms, an aliphatic hydrocarbon radical having from 10 to 18 carbon atoms, a cycloaliphatic hydrocarbon radical having from 6 to 15 carbon atoms, an araliphatic hydrocarbon radical having from 7 to 15 carbon atoms or an alkaromatic hydrocarbon radical having from 7 to 24 carbon atoms; and
the equivalent ratio of the components (A) and (B) is 100:0.5 to 100:20.

4,478,739

DARK COLORED COMPOSITION BASED ON LIQUID CRYSTALS

Jacques Cognard, Neuchatel, and Abdurrahman N. Basturk, Hauterive, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

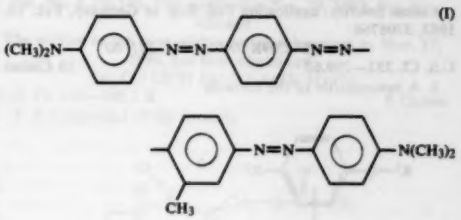
Filed Jun. 28, 1983, Ser. No. 508,615

Claims priority, application Switzerland, Jul. 16, 1982, 4345/82

Int. Cl.³ G02F *1/13*; C09K *3/34*

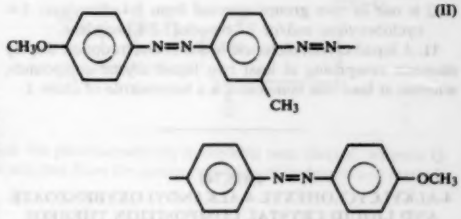
U.S. Cl. 252—299.1 **6 Claims**

1. Dark colored composition based on liquid crystals, especially for use in dichroic display cell, comprising a mixture of liquid crystals and of dyes respectively red, yellow and blue, characterized by the fact that the red dye is the 4,4'-bis(p-dimethyl-amino-phenylazo)-2-methyl-azobenzene of formula (I),



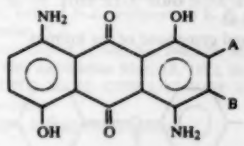
(I)

the yellow dye is the 4,4'-bis(p-methoxy-phenylazo)-2-methyl-azobenzene of formula (II),



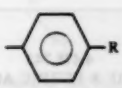
(II)

and the blue dye is an anthraquinonic derivative represented by the general formula (III),

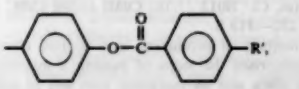


(III)

in which A is H or



and B is H or



where R and R', identical or different, are a lower alkyl or alkoxy group, one of the A and B being H when the other is not H.

4,478,740

BENZONITRILES

Rudolf Eidenschink, Dieburg; Jürgen Eichler, Breuberg, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

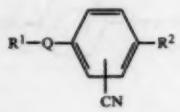
Filed Feb. 18, 1983, Ser. No. 467,990

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205766

Int. Cl.³ C09K 3/34; C07C 121/60

U.S. Cl. 252—299.62 14 Claims

1. A benzonitrile of the formula



wherein

R^1 and R^2 are each independently alkyl of 1–8 C atoms, or one is C_{1-8}-alkyl and the other is alkoxy of 1–8 C atoms; and

Q is one or two groups selected from 1.4-phenylene, 1,4-cyclohexylene and/or 1,4-bicyclo[? 2.2]-octylene.

11. A liquid crystal dielectric useful in electrooptical display elements comprising at least two liquid crystal compounds, wherein at least one compound is a benzonitrile of claim 1.

4,478,741

4-ALKYLCYCLOHEXYL 4-ALKANOYLOXYBENZOATE AND LIQUID CRYSTAL COMPOSITION THEREOF

Kenichi Nakagawa, Tenri; Shigehiro Minezaki, Ikoma, and Fumiaki Funada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

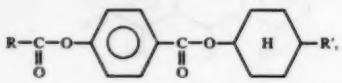
Filed Apr. 29, 1983, Ser. No. 489,890

Claims priority, application Japan, Apr. 30, 1982, 57-74426

Int. Cl.³ C09K 3/34; G02F 1/13; C07C 69/78, 69/88

U.S. Cl. 252—299.63 6 Claims

1. A liquid crystal compound of the formula:



wherein R and R' are straight chain alkyl groups each having 1 to 7 carbon atoms.

4,478,742

PREPARATION OF A FERRIC ACETATE COATED SILICA SOL BY SELECTIVE ANION EXCHANGE

Charles C. Payne, Aurora, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 301,508, Sep. 14, 1981, abandoned. This application May 10, 1983, Ser. No. 493,396

Int. Cl.³ B01J 13/00; C04B 35/00; C09C 1/22

U.S. Cl. 252—313 S 2 Claims

1. A method of producing iron acetate coated silica sol which comprises the steps of passing a mixture of ion-free colloidal silica and an inorganic iron salt in contact with a strong base anion exchange resin in the acetic acid salt form under conditions whereby the iron salt is converted to the iron acetate and is coated on the silica sol, thereby producing an iron acetate coated silica sol.

4,478,743

ORGANOLEPTIC USES OF NORBORNYL OXYACETALDEHYDE

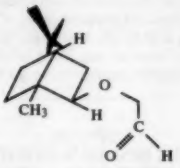
Robert P. Belko, Woodbridge; Richard M. Boden, Ocean, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 456,984, Jan. 10, 1983, , which is a continuation-in-part of Ser. No. 357,157, Mar. 11, 1982, Pat. No. 4,391,744, which is a division of Ser. No. 303,012, Sep. 17, 1981, Pat. No. 4,354,043. This application Feb. 23, 1984, Ser. No. 582,757

Int. Cl.³ A61K 7/46; C11B 9/00

U.S. Cl. 252—522 R 2 Claims

1. A process for augmenting or enhancing the aroma of a consumable material selected from a group consisting of perfumes or colognes comprising the step of intimately admixing with said consumable material the norbornyl oxyacetaldehyde having the structure:



4,478,744

METHOD OF OBTAINING ANTIBODIES

Louis M. Mezei, Fremont; Jung S. Chen, Foster City; John J. Huang, San Mateo, and Robert E. Lovins, Novato, all of Calif., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jan. 25, 1982, Ser. No. 342,418

Int. Cl.³ C07C 103/52; C07G 7/00; A61K 39/00, 37/00

U.S. Cl. 260—112.5 R 6 Claims

1. A method of preparing an antigen useful in obtaining antibodies against HbAlc, which antibodies are substantially free of cross-reactivity to nonglycosylated hemoglobin, said method comprising the steps of:

(a) synthesizing a hapten consisting of a peptide having the formula Val—His—Leu—Y wherein Y is chosen from the group consisting of Thr—, Thr—Pro—, Thr—Pro—Glu—, Thr—Pro—Glu—Glu—, Thr—Pro—Glu—Glu—Lys—, Thr—Pro—Glu—Glu—Lys—Ser—, and Thr—Pro—Glu—Glu—Lys—Ser—Ala—, said hapten thereby having an amino acid sequence corresponding to the NH_2 terminus of the hemoglobin β-chain;

(b) reacting the peptide of step (a) with glucose to obtain a glycosylated peptide having the formula

glucose—Val—His—Leu—Y;

and

(c) conjugating the glycosylated peptide of step (b) with a protein to form an antigen suitable for injection into a host animal whose metabolism does not naturally produce HbAlC for production of antibodies thereto.

4,478,745

T-BUTYLOXY-CARBONYL-D-PHENYLALANYL-L-PROLYL-L-ARGININE ALDEHYDE HEMISULFATE, D-PHENYLALANYL-L-PROLYL-L-ARGININE ALDEHYDE SULFATE AND PROCESS FOR THE PREPARATION THEREOF

Sándor Bajusz, Budapest; Erzsébet Szell née Hasenohrl, Budapest; Éva Barabás, and Dániel Bagdy, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Continuation-in-part of Ser. No. 337,288, Jan. 5, 1982, Pat. No. 4,399,065. This application Apr. 14, 1983, Ser. No. 484,888
Claims priority, application Hungary, Jan. 13, 1981, 70/81
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. tert.-butyloxy-carbonyl-D-phenylalanyl-L-prolyl-L-arginine aldehyde hemisulfate.

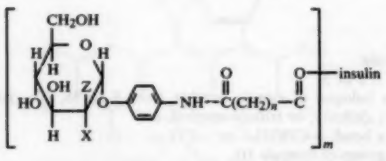
4,478,746

GLYCOSYLATED INSULIN DERIVATIVES

Wan S. Kim, 4512 Jupiter Dr., Salt Lake City, Utah 84117; Seo Y. Jeong, 716 Medical Pl. N., Salt Lake City, Utah 84112, and James C. McRea, 1876 E. 2700 S., Salt Lake City, Utah 84106

Division of Ser. No. 442,362, Nov. 17, 1982, Pat. No. 4,444,683. This application Feb. 6, 1984, Ser. No. 532,697
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.7 5 Claims

1. A glycosylated insulin having the formula



wherein X and Z are different and are selected from the group consisting of —H and —OH, n is an integer of 2 to 6 and m is an integer of 1 to 3, and wherein each glycosyl group is attached to the insulin by an amide linkage through one or more of the α-amino groups of the A-1 glycine, B-1 phenylalanine or ε-amino group of the B-29 lysine moieties of the insulin molecule.

4,478,747

BIOLOGICALLY PRODUCED ACID PRECIPITABLE POLYMERIC LIGNIN

Don L. Crawford, and Anthony L. Pometto, III, both of Moscow, Id., assignors to Genetics International, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 376,951, May 11, 1982, abandoned. This application May 9, 1983, Ser. No. 493,024
Int. Cl.³ C07G *1/00*
U.S. Cl. 435—72 11 Claims

1. A process for converting native lignin to an acid precipitable polymeric product characterized by an increased number of phenolic hydroxyl groups and carboxylic acid groups relative to said native lignin, said process comprising the steps of incubating said native lignin in a culture medium with a bacterium of the genus Streptomyces known to degrade lignin, extracting said incubated culture medium with an aqueous solvent, acidifying said extract, and collecting the resulting precipitate.

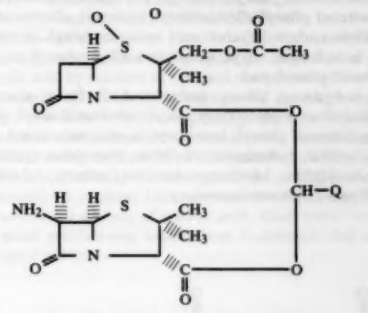
4,478,748

BIS-ESTERS OF ALKANEDIOLS

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 236,407, Feb. 20, 1981, Pat. No. 4,364,957, which is a continuation-in-part of Ser. No. 79,127, Sep. 26, 1979, Pat. No. 4,256,733. This application Sep. 20, 1982, Ser. No. 420,460
The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.
Int. Cl.³ C07D *499/00*; A61K *31/425*
U.S. Cl. 260—245.2 R 6 Claims

1. A compound of the formula



and the pharmaceutically-acceptable salts thereof, wherein Q is selected from the group consisting of hydrogen and methyl.

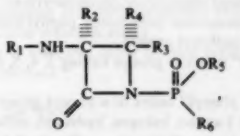
4,478,749

2-OXO-1-(SUBSTITUTED PHOSPHOROUS)AZETIDINES

William H. Koster, Ringoes, and Christopher M. Cimarusti, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 248,929, Mar. 30, 1981, abandoned. This application Mar. 15, 1982, Ser. No. 358,140
Int. Cl.³ C07D *205/08*; C07F *9/65, 9/58*; A61K *31/675*
U.S. Cl. 260—245.4 24 Claims

1. A β-lactam having the formula

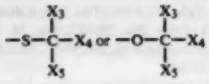


or a pharmaceutically acceptable salt thereof, wherein

R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

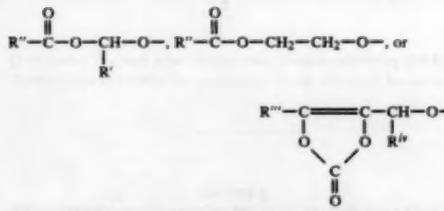
R_3 and R_4 are the same or different and each is hydrogen, alkyl, cycloalkyl, phenyl or substituted phenyl, or one of R_3 and R_4 is hydrogen and the other is alkoxycarbonyl, alken-1-yl, alkyn-1-yl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2X_1$ (wherein X_1 is azido, amino, hydroxy, alkanoylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, halogen, benzylthio, (substituted phenyl)methylthio, triphenylmethylthio, cyano or mercapto), $—S—X_2$ or $—O—X_2$ (wherein X_2 is alkyl, phenyl, substituted phenyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl), or



wherein one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; and X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

R_5 is hydrogen, alkyl, substituted alkyl, phenyl, or substituted phenyl; and

R_6 is hydroxy, alkoxy, (substituted alkyl)oxy, phenyloxy, (substituted phenyl)oxy, alkyl, substituted alkyl, phenyl, substituted phenyl, heteroaryl, amino, substituted amino, alkylthio, (substituted alkyl)thio, phenylthio, (substituted phenyl)thio, 1-(ethoxycarbonyloxy)ethoxy, 1,3-dihydro-3-oxo-1-isobenzofuranyloxy,



wherein R′ is hydrogen or alkyl, R″ is alkyl or phenyl, R‴ is hydrogen, methyl or phenyl, and R^{iv} is hydrogen or together with R‴ is $-(CH_2)_3-$ or $-(CH_2)_5-$; wherein

the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "substituted alkyl" refers to an alkyl group substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkoxy, phenyloxy, (substituted phenyl)oxy, (heteroaryl)oxy, mercapto, alkylthio, phenylthio (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups,

the terms "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;

the terms "alken-1-yl", "alkyn-1-yl" and "alkanoyl" refer to groups having 2 to 10 carbon atoms;

the term "heteroaryl" refers to thienyl, furyl, pyrrolyl, pyridinyl, pyrazolyl, pyrazinyl, thiazolyl, pyrimidinyl or tetrazolyl or one of the above groups substituted with one or more halogen, hydroxyl, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms groups;

the term "substituted amino" refers to a group having the formula $-NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl and Y_2 is alkyl phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino.

4,478,750

1-PHENYL-AZEPINOINDOLES

Fulvio Gadient, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

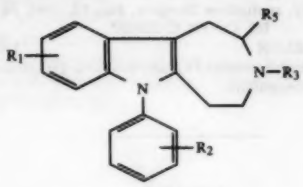
Continuation of Ser. No. 201,251, Oct. 27, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,867

Claims priority, application Switzerland, Nov. 2, 1979, 9852/79

Int. Cl.³ A61K *31/55*; **C07D** *471/04, 487/04*

U.S. Cl. 260—245.7 **7 Claims**

1. An azepinoindole of formula I,

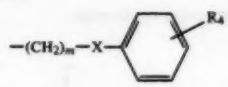


I

wherein

R_1 and R_2 are each independently hydrogen, halogen of atomic number from 9 to 35, (C_{1-4})alkyl, (C_{1-4})alkoxy, (C_{1-4})alkylthio, hydroxy, or trifluoromethyl,

R_3 is hydrogen, (C_{1-4})alkyl, (C_{3-6})cycloalkyl, (C_{4-9})cycloalkylalkyl, (C_{3-5})alkenyl, $(C_{3-5}$alkynyl, a group of formula II,



II

wherein

m is 1, 2 or 3,

R_4 is halogen of atomic number from 9 to 35, (C_{1-4})alkyl, (C_{1-4})alkoxy, or trifluoromethyl, and

X is a bond, —CHOH— or —CO—,

or a group of formula III,

$$-(CH_2-CH_2-O)_nH \qquad \text{III}$$

wherein

n is 2 or 3, and

R_5 is hydrogen or (C_{1-4})alkyl,

said compound being in free base or in pharmaceutically acceptable acid addition salt form.

4,478,751

COMPLEX SALTS HAVING HIGH ELECTRIC CONDUCTIVITY

Friedrich Jonas, Aachen; Jürgen Hocker, Berg.-Gladbach, both of Fed. Rep. of Germany, and Bruno Broich, Baden, Switzerland, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,668

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133738

Int. Cl.³ C07C *50/00*

U.S. Cl. 260—396 N **3 Claims**

1. A complex corresponding to the following general formula (I):

$$S^{\oplus}R^1R^2R^3[X.TCNQ]^{\ominus} \qquad \text{(I)}$$

wherein

R^1, R^2 and R^3 independently represent alkyl, optionally substituted cycloalkyl or optionally substituted aralkyl;

X represents halogen; and

TCNQ represents 7,7,8,8-tetracyano-p-quinodimethane.

4,478,752

PROCESS FOR OXIDIZING PHENOL TO P-BENZOQUINONE

Chao-Yang Hsu, Media, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Tech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 284,893, Jul. 20, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 423,984

Int. Cl.³ C07C 50/04

U.S. Cl. 260—396 R 21 Claims

1. In the process of oxidizing phenol to benzoquinone in a nitrile solvent with a bivalent copper salt catalyst selected from the group of halides and nitrates the improvement of obtaining increased selectivity by promoting the catalyst with a base wherein the mole ratio of the base to the copper catalyst is from 1:2 to about 2:1.

4,478,753

PROCESS FOR THE PRODUCTION OF 11,11,12,12-TETRACYANO-9,10-ANTHRAQUINODIMETHANE OR ITS DERIVATIVES

Shu Hotta, Hirakata; Tomiharu Hosaka, Yawata; Nobuo Sonoda, Settsu, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

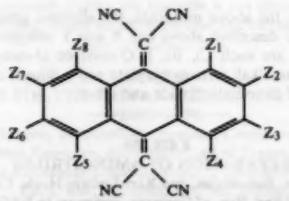
Filed Sep. 28, 1982, Ser. No. 426,069

Claims priority, application Japan, Sep. 29, 1981, 56-155592

Int. Cl.³ C07C 121/64

U.S. Cl. 260—396 N 12 Claims

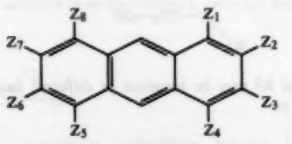
1. A process for producing a 11,11,12,12-tetracyano-9,10-anthraquinodimethane of the general formula (I)



(I)

in which Z_1, Z_4, Z_5 and Z_8 independently represent hydrogen, chlorine, hydroxy or amino group, and Z_2, Z_3, Z_6 and Z_7 independently represent hydrogen, halogen, alkyl having 1 to 8 carbon atoms, phenyl, alkylphenyl whose alkyl group has 1 to 2 carbon atoms, hydroxyalkyl whose alkyl group has 1 to 8 carbon atoms, carboxyalkyl whose alkyl group has 1 to 8 carbon atoms, hydroxy, amino or carboxyl group, the process comprising the steps of:

(a) providing an anthracene compound of the general formula (II)



(II)

in which Z_1, Z_2, Z_3, Z_4, Z_5, Z_6, Z_7 and Z_8 have the same meanings as defined above, respectively:

(b) halomethylating the anthracene compound to introduce dicyanomethyl groups into the anthracene compound at the 9 and 10 positions;

(c) formylating the halogenomethylated compound at the halogenomethyl groups;

(d) dihalogenomethylating the formylated compound;

(e) dicyanomethylating the dihalogenomethylated compound; and

(f) subjecting the dicyanomethylated compound to dehydrogenation to obtain the compound of the general formula (I).

4,478,754

PREPARATION OF PHENYL ESTERS IN THE PRESENCE OF BORIC ANHYDRIDE

Josephine L. Y. Kong-Chan, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 1, 1982, Ser. No. 437,918

Int. Cl.³ C09F 5/08; C07C 69/00

U.S. Cl. 260—410.5 6 Claims

1. An improved process for preparing a phenyl ester of a carboxylic acid by reaction of a phenol compound with a C_2 to C_{20} carboxylic acid wherein at least one of the carbon atoms adjacent the carbon atom bearing the OH group in the phenol compound is unsubstituted, the improvement comprising the step of conducting the reaction in the presence of boric anhydride in a molar ratio of boric anhydride to carboxylic acid of from about 0.4:1 to about 1.6:1, said reaction being conducted in the substantial absence of sulfuric acid, alkali metal borates, alkali metal polyborates, alkali metal hydroxides and alkali metal borohydrides.

4,478,755

TITANATE COMPOSITIONS HAVING DEPRESSED FREEZING POINTS

Gordon B. Robbins, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 5, 1982, Ser. No. 439,566

Int. Cl.³ C07F 7/28

U.S. Cl. 260—429.5 16 Claims

1. A composition comprising the reaction product obtained by reacting (i) a titanate represented by the empirical formula

$$(R^1O)_4Ti$$

with (ii) an acetoacetate and removing all or part of the R^1OH thereby generated and replacing all or part of it by combining the resulting titanate/acetoacetate reaction product with (iii) a substance which is either

(a) at least one other titanate represented by the empirical formula

$$(R^2O)_4Ti$$

or

(b) at least one alcohol represented by the empirical formula

$$R^3OH$$

wherein the titanate:acetoacetate mol ratio is in the range between 1:1 and 1:2;

R^2 and R^3 differ from R^1; and

R^1, R^2 and R^3 are each methyl, ethyl, 2-chloroethyl, isopropyl, n-propyl, n-butyl, n-pentyl, 2-pentyl, 3-methylbutyl, 2-methoxyethyl, or methoxyethoxyethyl;

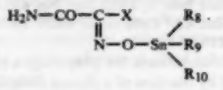
the quantity of said substance being sufficient, even in the presence of a nucleating agent, to depress the freezing point of the reaction product obtained by combining said first-mentioned titanate with acetoacetate.

4,478,756
OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 271,310, Jun. 8, 1981, abandoned, which is a division of Ser. No. 68,262, Aug. 20, 1979, Pat. No. 4,294,722.
This application Sep. 30, 1982, Ser. No. 431,459
Claims priority, application Switzerland, Aug. 31, 1978, 9200/78
Int. Cl.³ C07F 7/22
U.S. Cl. 260—429.7 **3 Claims**

1. An oxime derivative of the formula I



wherein X is cyano or carboethoxy and R_8, R_9 and R_{10} are the same and are C_1–C_4alkyl, benzyl or phenyl.

4,478,757
PROCESS FOR THE MANUFACTURE OF AROMATIC ISOCYANATES

Jacques Kervennal, Lyons; Jean-Marie Cognion, Saint Genis Laval, and Pierre Braunstein, Strasbourg, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Oct. 29, 1982, Ser. No. 437,810
Claims priority, application France, Nov. 3, 1981, 81 20567
Int. Cl.³ C07C 118/06
U.S. Cl. 260—453 PC **7 Claims**

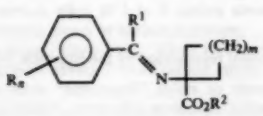
1. In the process for the manufacture of aromatic isocyanates by carbonylation of nitro derivatives, the improvement comprising carrying out the reaction in the presence of a supported catalyst comprising as the active phase particles or an oxide of a precious metal of Group VIII and of a metal selected from Group V_B, VI_B, or VIII of the Periodic Table; and precursor of the active phase being a heteropolymetallic cluster.

4,478,758
PREPARATION OF SCHIFF BASES OF AMINOCYCLOALKANECARBOXYLIC ACIDS ESTERS

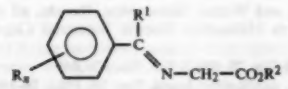
Günter Schulz; Ernst Buschmann, and Bernd Zeeh, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,497
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125872
Int. Cl.³ C07C 121/78, 119/14
U.S. Cl. 260—465 D **1 Claim**

1. A process for the preparation of a Schiff base of an aminocycloalkanecarboxylic acid ester of the formula I



where R is hydrogen, halogen, alkyl, alkoxy, alkylthio, alkylsulfonyl, haloalkyi, nitro, cyano, unsubstituted phenyl, unsubstituted phenoxy or a phenyl or phenoxy hich is substituted with the same or different substituents selected from the group consisting of cyano, nitro, halogen and haloalkyl of not more than 2 carbon atoms, R^1 is hydrogen, alkyl, alkenyl, alkynyl, an unsubstituted cycloalkyl of from 5 to 7 carbon atoms or a cycloalkyl substituted with an alkyl of from 1 to 4 carbon atoms, unsubstituted aryl or aryl substituted by the same or different substituents selected from the group consisting of halogen, cyano, nitro, acetylamino, an alkyl of not more than 4 carbon atoms, phenyl, phenoxy and a haloalkyl of not more than 2 carbon atoms, R^2 is alkyl, alkenyl, alkynyl, an unsubstituted cycloalkyl of from 5 to 7 carbon atoms or a cycloalkyl substituted with an alkyl of from 1 to 4 carbon atoms, unsubstituted aryl, unsubstituted arylalkyl or an aryl or arylalkyl which is substituted by the same or different substituents selected from the group consisting of halogen, cyano, nitro, acetylamino, an alkyl of not more than 4 carbon atoms, phenyl, phenoxy and haloalkyl of not more than 2 carbon atoms, n is 1, 2 or 3 and m is an integer of from 0 to 8, and 1 or 2 hydrogen atoms in the cycloalkyl ring can be replaced by alkyl, alkenyl, alkynyl, a cycloalkyl of from 5 to 7 carbon atoms or a cycloalkyl substituted with an alkyl of from 1 to 4 carbon atoms, aryl, arylalkyl or an aryl or arylalkyl which is substituted by the same or different substituents selected from the group consisting of halogen, cyano, nitro, acetylamino, alkyl of not more than 4 carbon atoms, phenyl, phenoxy and a haloalkyl of not more than 2 carbon atoms, wherein an aminoacetic acid derivative of the formula II



where R, R^1, R^2 and n have the above meanings, is reacted with an α,ω-disubstituted alkane of the formula III

$$X—CH_2—(CH_2)_m—CH_2—Y \quad (III)$$

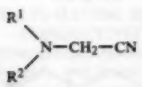
where m has the above meanings, the alkylene group can be substituted as described above and X and Y independently of one another are each Cl, Br, I, O-tosyl or O-mesyl, in the presence of an aikali tertiary butylate and a diluent consisting essentially of dimethylsulfoxide and ether.

4,478,759
PREPARATION OF AMINOITRILES

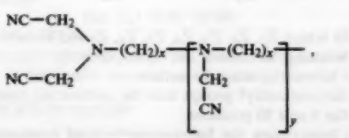
Harry Distler, Bobenheim, and Karl-Ludwig Hock, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,649
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029205
Int. Cl.³ C07C 120/00, 120/43
U.S. Cl. 260—465.5 A **9 Claims**

1. A process for the preparation of an aminoacetonitrile of the formula



where R^1 and R^2 may be identical or different and each is $—CH_2—CN$ or

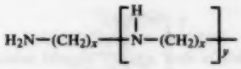


R^1 can also be an alkyl of 1 to 8 carbon atoms and the symbols X and Y can be identical or different and x is 1, 2 or 3 and y is 0, 1, 2 or 3, which process comprises: reacting ammonia or an amine with formaldehyde and hydrogen cyanide in the pres-

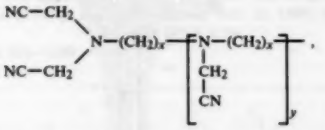
ence of an additional acid, wherein the nitrogen compound used has the formula

II

where R^3 and R^4 are each hydrogen, or R^3 or R^4 or both are



if R^1 or R^2 or both are



and R^3 can also have the same meaning as R^1 if R^1 is an alkyl of 1 to 8 carbon atoms and x and y have the above meanings, wherein the reaction is conducted at a pH of below 2, and at from 10° to 70° C., and wherein hydrogen cyanide is added to the reaction mixture at a rate such that the concentration of hydrogen cyanide during the reaction is not more than 3 percent by weight, based on the total reaction mixture.

4,478,760

PROCESS FOR THE PREPARATION OF FLUORINATED PRODUCTS

Hubert Blancou, Montpellier; Auguste Commeyras, Clapiers, and Robert Teissedre, Montpellier, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Mar. 30, 1981, Ser. No. 249,069

Claims priority, application France, Apr. 18, 1980, 80 08721

Int. Cl.³ C07C *121/16, 121/20, 69/34, 69/63*

U.S. Cl. 260—465.7 **4 Claims**

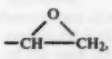
1. A process for the preparation of fluorinated products having the formula:

$$R_F—CHR_1—CHR_2—y$$

in which

(a) R_F represents a straight or branched perfluorinated chain C_nF_{2n+1}, with n being a whole number between 1 and 20;

(b) y is selected from the hydroxy, carboxy, nitrile, halogen,



thiol, thiocyanate, carbethoxy, acetoxy, $CONH_2$, hydroxymethyl and acetoxymethyl groups; and

(c) R_1 and R_2 are the same or different and are y, a hydrogen atom, an alkyl, cycloalkyl, phenyl, or alkylphenyl radical; consisting essentially of reacting a perfluoroalkyl iodide and a monoethylenic compound of the formula:

$$CHR_1=CR_2y$$

in the presence of a finely divided zinc powder and an acidic solvent consisting of an organic, inorganic acid, or a mixture thereof with an organic solvent, at a temperature of from 20° to 100° C., and separating the fluorinated product from the reaction medium.

4,478,761

METHOD FOR PREPARING FLUORINE-CONTAINING PHOSPHONATES

Donald J. Burton, Iowa City, Iowa, and Richard M. Flynn, Bethesda, Md., assignors to University of Iowa Research Foundation, Iowa City, Iowa

Division of Ser. No. 143,995, Apr. 28, 1980, Pat. No. 4,330,486. This application Apr. 22, 1983, Ser. No. 487,543

Int. Cl.³ C07F *9/40*

U.S. Cl. 260—970 **1 Claim**

1. A method of making a compound having the formula

comprising reacting a compound of the formula

with a compound of the formula:

$$CF_2XY$$

wherein R and R' are alkyl from 1 to 16 caron atoms, X and Y are the same or different halogen and M is alkali metal, wherein the halogen is selected from the group consisting of chlorine, bromine and iodine.

4,478,762

PROCESS FOR THE PREPARATION OF THE POTASSIUM SALT OF PHOSPHOENOLPYRUVIC ACID

George M. Whitesides, Newton; Bernard L. Hirschbein, Somerville, both of Mass., and Francois P. Mazenod, Geneva, Switzerland, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

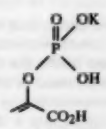
PCT No. PCT/US82/00402, § 371 Date Aug. 30, 1982, § 102(e) Date Aug. 30, 1982, PCT Pub. No. WO83/03412, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 29, 1982, Ser. No. 416,391

Int. Cl.³ C07F *9/40*

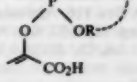
U.S. Cl. 260—983 **4 Claims**

1. Process for the preparation of the potassium salt of phosphoenolpyruvic acid (PEP-K) of the formula



characterized by the fact that the two following reaction steps are carried out consecutively:

a. The treatment of a halopyruvic acid with a trialkyl phosphite to obtain a dialkyl phosphate of enolpyruvic acid of the formula



wherein the symbols R, taken separately, represent a lower alkyl radical, or taken together, represent a lower alkylenyl radical, and

b. Hydrolysis of the compound thus obtained in an aqueous medium and in the presence of potassium hydroxide.

4,478,763

PROCESS FOR PREPARING ALPHA-FLUORINATED ALKANEDIPHOSPHONATES

Charles E. McKenna, Los Angeles, Calif., assignor to Univ. of Southern California, Los Angeles, Calif.

Filed Oct. 20, 1982, Ser. No. 435,578

Int. Cl.³ C07F 9/40, 9/38

U.S. Cl. 260—986 **4 Claims**

1. A process for the preparation of α-fluorinated methanediphosphonates comprising reacting a methanediphosphonate ester having the formula

$$[(RO_2P(O)]\text{-}CH_2\text{-}[P(O)(R_xO)_2]$$

with potassium tert-butoxide to form a methanediphosphonate carbanion, and reacting said carbanion with perchloryl fluoride, where R and R_x are the same or dissimilar alkyl or aromatic radicals.

4,478,764

AIR VALVE TYPE CARBURETOR

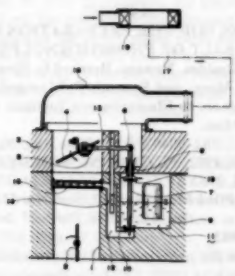
Akira Ii, Toyoda; Toshio Morikawa, Okazaki, and Hirosi Suwahara, Toyota, all of Japan, assignors to Toyota Jidoshi Kabushiki Kaisha, Aichi, Japan

Filed Nov. 5, 1982, Ser. No. 439,583

Claims priority, application Japan, Mar. 4, 1982, 57-33035

Int. Cl.³ F02M 7/22

U.S. Cl. 261—50 A **8 Claims**



1. In an air valve type carburetor of the kind in which a barrel provided with a throttle valve has a main nozzle interacting with a jet disposed inside the float chamber of a fuel bowl and an air valve positioned in an air horn at the upper part of said barrel is interconnected by a link to the upper end of a metering needle inserted into a through-hole of said air horn for free vertical movement therein and facing said jet at the lower end of the needle, said through-hole having access to an air cleaner through an air connector, the improvement wherein a shield plate is rigidly fixed to the shank of said metering needle at a position in said fuel bowl proximate said through-hole when said air valve is fully open.

4,478,765

APPARATUS FOR AERATING WATER SUPPLIES

Dean L. Tubbs, P.O. Box 116, Appleton, Minn. 56208

Filed Aug. 18, 1982, Ser. No. 409,062

Int. Cl.³ B01F 3/04

U.S. Cl. 261—76 **16 Claims**

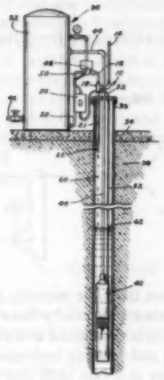
1. An apparatus for aerating water from an underground well having a ground water level therein below the surface of the ground, said apparatus including:

a. a pressure tank situated above the water level in the underground well;

b. a well water supply pipe leading from below the surface of the water in the well to the interior of the pressure tank;

c. pump means for delivering water from the well through the supply pipe to the pressure tank under pressure;

d. an aerator having an air inlet port, a water inlet port and an air/water discharge port, said air inlet port being open to the atmosphere;



e. conduit means open from a below-water portion of the pressure tank to the aerator water inlet port;

f. a turbulation flow pipe open between the air/water discharge port and the ground well above the level of water in the ground well; and

g. said aerator having a mixing chamber open to said air and water inlet ports and to said air/water discharge port, said aerator including means to draw air into said air inlet port, to mix the air with the water entering the water inlet port, and to discharge this air/water mixture in a turbulent flow state out of said air/water discharge port, all responsive to the flow of water under pressure into the water inlet port.

4,478,766

AIR DIFFUSER FOR WASTE WATER TREATMENT

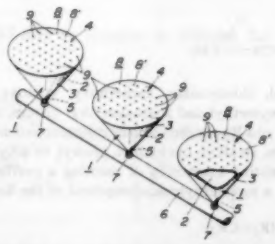
Hiroyuki Horikita, Nagoya, and Tetsuo Kataoka, Kuwana, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 21, 1983, Ser. No. 477,401

Claims priority, application Japan, Aug. 13, 1982, 57-123255[U]

Int. Cl.³ B01F 3/04

U.S. Cl. 261—124 **11 Claims**



1. An air diffuser for waste water treatment, comprising:

a main body defining an air chamber therein, the main body

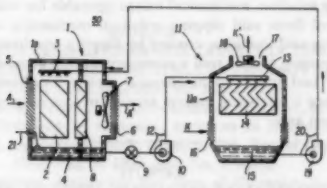
having a first end and a second end, said first end is adapted to receive air into the air chamber therethrough, and said second end has a non-porous material comprising a rigid diffuser plate, attached thereto, said rigid diffuser plate having a plurality of artificially formed pores therethrough for diffusing air from said air chamber through said pores into a waste water solution, said diffuser plate having a smooth outer surface and at least 95% of said plurality of pores having diameters which are within ±20% of a nominal diameter selected from a range between 50 μm and 300 μm.

4,478,767

AIR COOLING DEVICE

Osamu Watanabe; Hisashi Tanaka, both of Yokohama; Hitoshi Yoshino, Matsudo, and Toshiaki Sadamasu, Hiratsuka, all of Japan, assignors to Toshiba Corporation, Kawasaki, Japan

Continuation of Ser. No. 237,480, Feb. 23, 1981, abandoned.
This application Dec. 8, 1982, Ser. No. 447,959
Claims priority, application Japan, Feb. 22, 1980, 55-21132
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—130 **8 Claims**



1. A device for cooling and humidifying dry, hot air comprising:

first means for spraying cooling water;

an air cooling part wherein the cooling water sprayed from said first water spray means is brought into direct contact with intake air introduced thereinto from outside of said air cooling device so that said intake air is cooled and humidified by said water through active heat exchange and latent heat exchange caused by evaporation of said cooling water into said air;

means for cooling water brought into heat exchange contact with said intake air;

means for returning the sprayed water brought into heat exchange with said intake air in said air cooling part to said first water spray means via said water cooling means, wherein said water is circulated to said first water spray means after being cooled in said water cooling means;

means for controlling the temperature of the air cooled in said cooling device wherein said air cooled in said air cooling part is adapted to be fed to a compartment equipped with electrical apparatus to thereby reduce the time necessary for preparatory operation of said air cooling device and reducing adverse effects on said electrical apparatus;

wherein said means for controlling the temperature of the cooled air includes a means for detecting the temperature of the said cooled air, said temperature detecting means being located near an output louver of said air cooling part;

wherein said water returning means further includes a first means for receiving and reserving water that has passed through said air cooling part and a means for circulating water from said first means for receiving and reserving water to said first water spray means via said water cooling means, wherein said water is circulated to said first water spray means after being cooled in said water cooling means;

wherein said first means for receiving and reserving water includes a first water reservoir;

wherein said means for circulating water includes a first pump for circulating the water in said first water reservoir to said water cooling means and a second pump for circulating the water cooled in said water cooling means to said first water spray means;

wherein said water cooling means includes:

second means for spraying cooling water circulated from said first reservoir by said first pump;

a water cooling part wherein the water sprayed from said second water spray means is brought into direct contact with intake air introduced thereinto from outside of said air cooling device so that said water is evaporatively cooled;

a second water reservoir for receiving and reserving said water circulated in said water cooling part; and

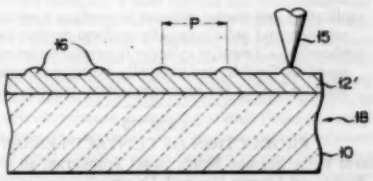
wherein said water reserved in said second water reservoir is circulated to said first water spray means by said second pump.

4,478,768

METHOD FOR MANUFACTURING OPTICAL TYPE RECORDING MEDIUM

Yoshikatsu Takeoka, Kawasaki, and Nobuaki Yasuda, Zushi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 8, 1983, Ser. No. 473,244
Claims priority, application Japan, Mar. 15, 1982, 57-39432
Int. Cl.³ B29D *17/00*
U.S. Cl. 264—1.4 **17 Claims**



1. A method for manufacturing a record carrier body, comprising the steps of:

forming on a substrate a radiation-sensitive layer which absorbs energy from a laser beam with which said layer is irradiated and which locally expands and deforms due to the absorbed energy, said radiation-sensitive layer being a single layer which is made of a material capable of absorbing the laser beam energy, and which discharges a gas component and locally expands due to said discharged gas generated as a result of the absorbed energy; and

radiating a laser beam of a suitable energy onto said radiation-sensitive layer to form an optically identifiable projected pattern, thereby forming the record carrier body for storing information corresponding to the beam.

4,478,769

METHOD FOR FORMING AN EMBOSSING TOOL WITH AN OPTICALLY PRECISE PATTERN

Robert M. Pricone, Vernon Hills, and Anthony J. Montalbano, Lake Barrington Shores, both of Ill., assignors to Amerace Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,866
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—1.6 **23 Claims**

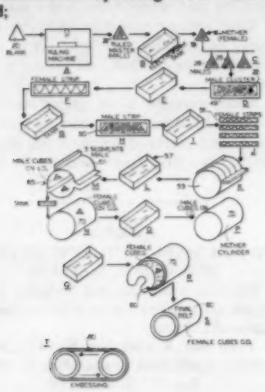
1. A method of making a thin flexible seamless generally cylindrical embossing tool for continuous embossing of a web of material with an optically precise pattern having sharp angles and flatness of faces in certain detail, comprising the steps of forming at least one master element to the precision optical pattern required;

assembling a contiguous cluster of master elements, at least one of which has the pattern therein;

replicating the assembled cluster to provide a number of flexible strips of contiguous pattern;

assembling said strips on a cylindrical mandrel and replicating such assembled strips to provide cylindrical segments;

assembling such segments to provide a cylinder of the desired dimensions corresponding to the width of web to be embossed;



replicating such cylinder to provide a seamless master cylinder;

replicating said master cylinder to produce a relatively thick seamless and metallurgically uniform mother cylinder;

replicating said mother cylinder to produce a relatively thin, seamless, flexible, and generally cylindrical metal embossing tool having the precision optical pattern therein.

4,478,770

PRODUCTION OF CONTACT LENSES

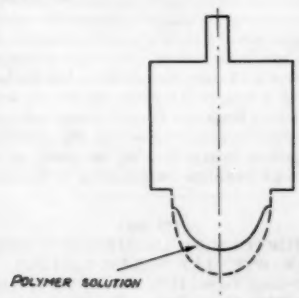
David Vofsi; Shymon Reich; Israel Tchoukran, all of Rehovot, Israel, and Joaquin Mayoral, Caracas, Venezuela, assignors to Yeda Research and Development Company, Ltd., Rehovot, Ill.X

Filed May 17, 1982, Ser. No. 378,655

Claims priority, application Israel, May 18, 1981, 62899

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—2.1 **8 Claims**



1. A process for production of a contact lens, comprising coating a tool made of an inert material and having a curvature corresponding to that of a first of two optical surfaces of the lens to be produced with a composition comprising a polymer suitable for contact lens manufacture, said process comprising the steps of immersing the tool in a solution of the polymer, withdrawing the tool, removing solvent so as to leave a solid layer as a coating of adequate thickness and then inverting the tool by 180° and subjecting it to planetary motion until the polymer is set and annealing said layer, said layer having an inner surface with a curvature corresponding to that of said tool and an outer surface, and machining said outer surface of said layer to desired dimensions while supported by said tool to form the second optical surface of said lens.

6. A process for the production of a contact lens, comprising coating a tool made of an inert material and having a curvature corresponding to that of a first of two optical surfaces of the lens to be produced with a composition comprising a polymer suitable for contact lens manufacture, said process comprising the steps of heating the tool to a temperature above the melting point of the polymer, dipping the tool into a fluidized bed of particles of said polymer until said tool is coated by a layer of molten polymer of adequate thickness, withdrawing the tool and layer of molten polymer, quenching said layer of molten polymer to form a solid layer, said layer having an inner surface with curvature corresponding to that of said tool and an outer surface, and machining said outer surface of said layer to desired dimensions while supported by said tool to form the second optical surface of said lens.

8. An apparatus for the production of contact lenses comprising a tool with a convex surface corresponding to a concave surface of a contact lens to be formed, said tool being made of an inert material and having a surface of optical quality, mechanical means operable for immersing said tool into a dipping solution, mechanical means operable for withdrawing said tool from said dipping solution, mechanical means for inverting said tool after coating by dipping, mechanical means for imparting to said tool a planetary motion around the main axis of said tool, and mechanical means for simultaneously imparting a rotational motion around an axis perpendicular to said main axis.

4,478,771

METHOD OF MANUFACTURING FIBRE-REINFORCED PLASTIC ARTICLES, A PREPREG FOR THE MANUFACTURE OF FIBRE-REINFORCED PLASTIC ARTICLES AND A FIBRE-REINFORCED PLASTIC ARTICLE

Herbert Schreiber, Seeblick 3, 8832 Wollerau, Switzerland

Filed Mar. 9, 1982, Ser. No. 356,442

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1981, 3109424

Int. Cl.³ H05B *1/00*

U.S. Cl. 264—22 **29 Claims**

1. A method of manufacturing fibre-reinforced plastic articles, said method comprising the steps of providing a planar prepreg containing reinforcing fibres impregnated by curable resins, covering at least one side of said prepreg with a flexible and stretchable resin, providing an open contoured mold, utilizing air pressure exerted on the covered side of the prepreg deforming the covered prepreg to conform to the contour of the mold, and curing the shaped prepreg thereafter, the viscosity of the totality of flowable materials present in the prepreg inclusive of possible filling agents and exclusive of any reinforcing fibres measured at the temperature of said deformation and a low shearing speed amounts to at least 10 Na/m^2 and less than about 100,000 Na/m^2 and the length of individual reinforcing fibres exceeds about 2 mm.

4,478,772

PROCESS FOR PREPARING CAST FILM OF THERMOPLASTIC RESIN

Norio Takagi, Zama, and Hiroshi Aoyagi, Iwakuni, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 21, 1983, Ser. No. 487,701

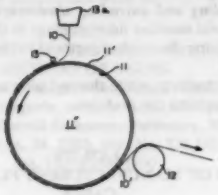
Claims priority, application Japan, Apr. 21, 1982, 57-65427

Int. Cl.³ B29D *7/02*

U.S. Cl. 264—22 **3 Claims**

1. A process for preparing a thermoplastic resin film by extruding a molten thermoplastic film-forming resin in the form of a continuous molten film onto an electrically grounded moving quenching surface, passing the molten film in proximity to but out of contact with at least one electrode which imparts an electrostatic charge to the film across its full width,

and withdrawing a solidified film thus formed from said quenching surface; which process comprises extruding the



molten film onto a quenching surface having a channel-like microcracked structure.

4,478,773

SCAFFOLDING GIRDER FOR CONSTRUCTING MULTIPLE-SPAN BRIDGE STRUCTURES MOVABLE FROM ONE BRIDGE TO ANOTHER

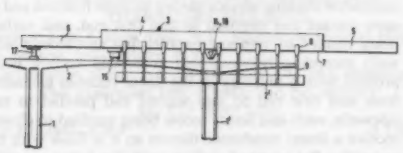
Wilhelm Büchler, Haar, and Karl-Hermann Mischlau, Munich, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,576

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933061

Int. Cl.³ E04B *1/16*

U.S. Cl. 264—31 **4 Claims**



1. In the construction of a pair of side-by-side bridges including vertically extending support piers and a continuous superstructure supported on the piers where a scaffolding girder and formwork dependently supported therefrom are used for forming the superstructure and where the scaffolding girder is moved on trestles suspended from the scaffolding girder in the longitudinal direction of the superstructure for forming individual sections thereof, the method of transferring the scaffolding girder comprising the steps of supporting the center of gravity of the scaffolding girder on a trestle over a pier of one of the bridges with the scaffolding girder extending hn the longitudinal direction of the one bridge, rotating the scaffolding girder about a vertical axis from the position extending in the longitudinal direction of the one bridge to a position extending transversely of the longitudinal direction of the pair of bridges with one of the trestles located over a pier of the one bridge, moving at least one other trestle to a position supported on a pier of the other bridge, moving the scaffolding girder in the transverse direction into a position with the center of gravity of the scaffolding girder supported over the trestle located over the pier of the other bridge, and rotating the scaffolding girder to a position extending in the longitudinally direction of the other bridge while maintaining the center of gravity of the scaffolding girder over the trestle located over the pier of the other bridge.

4,478,774

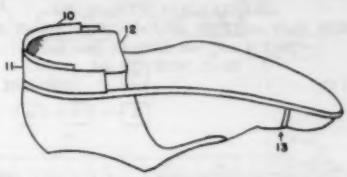
METHOD FOR REPAIRING HEELS OF SHOES

Tin B. Yee, 719 Erskine St., N.W., Huntsville, Ala. 35805

Filed Sep. 30, 1982, Ser. No. 431,239

Int. Cl.³ B29C *5/00, 11/00*

U.S. Cl. 264—36 **1 Claim**



1. A method of repairing the worn down rear edge of a heel in situ on an inverted shoe heel by forming a mold cavity with a strip of adhesive tape, which has a smaller strip of aluminum foil attached to a portion of its sticky side, said aluminum foil strip being large enough to cover the worn down rear edge area of the heel and also being used to facilitate the removal of the adhesive tape from the cured and dried repairing material, said method comprised of forming said mold cavity by wrapping said aluminum foil side of said adhesive tape assembly around the rear curved side of the heel to cover the worn down rear edge area; extending the adhesive tape assembly horizontally and vertically a little beyond the worn down rear edge area to form said mold cavity, thereby conforming to the shape of the original rear edge of the heel; introducing into said mold cavity and filling said mold cavity to the same level or height as the surface of the heel, a fluid mass of repairing material, comprised of a synthetic rubber, butadiene-styrene, in an organic solvent mixture, containing aramid fibers of varied sizes and a coloring material, said organic solvent mixture comprised of amyl acetate, xylene, toluene, aramid fibers, and coloring material, said amyl acetate being present up to about 3% by volume of said solvent, said xylene being several times more than the volume of amyl acetate and up to about 15% by volume of said solvent, and said toluene being several times more than the volumes of xylene and up to about 82% by volume of said solvent, said aramid fibers being of varied sizes with lengths less than an inch, said coloring material consisting of organic or inorganic dyes; allowing said repairing material to cure and dry; and removing said adhesive tape and aluminum foil by peeling.

4,478,775

METHOD OF EXTRUDING AND SHAPING THERMOPLASTIC MATERIAL

Gen Endo, Moriyama; Hirokazu Hori, Shiga; Yoshihiro Kawada, Shiga, and Junzo Sakai, Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 135,023, Mar. 28, 1980, abandoned. This application May 7, 1982, Ser. No. 376,042

Claims priority, application Japan, Apr. 5, 1979, 54-41694

Int. Cl.³ B29F *3/06*

U.S. Cl. 264—40.3 **10 Claims**

1. A method of extruding thermoplastic material comprising

(A) continuously feeding a substantially constant amount of said thermoplastic material from a constant volume feeder to a twin screw extruder,

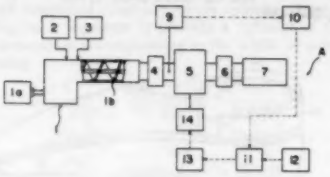
(B) continuously extruding a substantially constant amount of said thermoplastic material through said twin screw extruder,

(C) continuously feeding a substantially constant amount of said thermoplastic material extruded through said twin screw extruder to a die by means of a metering pump,

(D) measuring pressure of said thermoplastic material be-

tween said twin screw extruder and said metering pump, and

(E) adjusting rotational frequency of only said metering



pump with a proportional-integral-derivative (PID) system to diminish deviation of said measured pressure from a predetermined pressure value while rotation of said twin screw extruder is maintained constant.

4,478,776

METHOD OF MAKING MOLTEN CARBONATE FUEL CELL CERAMIC MATRIX TAPE

Donald L. Maricle, 226 Forest La., Glastonbury, Conn. 06033; Gary C. Putnam, 47 Walker St., Manchester, Conn. 06040, and Robert C. Stewart, Jr., 1230 Copper Hill Rd., West Suffield, Conn. 06093

Filed Sep. 30, 1981, Ser. No. 307,121
Int. Cl.³ C04B *41/32*
U.S. Cl. 264—83 **8 Claims**

1. A method of making a molten carbonate fuel cell ceramic matrix tape comprising admixing lithium aluminate particles having a particle size less than about 1 micron with an organic polymeric binder in a chlorinated hydrocarbon-alcohol solvent, admixing alumina particles having a particle size greater than about 25 microns with the aluminate-binder-solvent mixture, applying multiple coats of the admixture to a mold surface pretreated with a mold release agent,

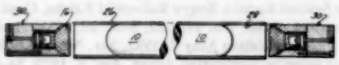
drying each coat between applications until a final dried coating thickness of about 5 mils to about 30 mils is obtained, and stripping the thus-formed ceramic mstrix tape from the mold surface.

4,478,777

METHOD FOR MAKING AN ELASTOMERIC MEMBER WITH END PIECES

Lyle O. Hoppie, Birmingham; Joseph H. McNinch, Jr., and Gregory C. Nowell, both of Livonia, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 25, 1983, Ser. No. 469,617
Int. Cl.³ B29C *11/00, 5/01*
U.S. Cl. 264—102 **7 Claims**



1. A method of molding, curing, and attaching a meshed material of an end piece to an elongated elastomeric member, comprising the steps of:

disposing a preform comprising a curable elongated elastomeric member into a seamless cylinder of sufficient length to provide a clearance space on either end thereof;

positioning the end piece into one end of said cylinder with the meshed material in juxtaposition with one end of said preform;

positioning an end plug assembly within each end of said cylinder with said meshed material sandwiched between said one end of the preform and an adjacent surface of the associated end plug assembly;

compressing said end plug assemblies against said preform for molding and extruding elastomeric material of said elastomeric member into openings in the meshed material for attaching the meshed material to the elastomeric member; and

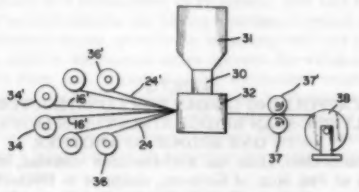
curing the preform while the end plug assemblies are compressed against the preform.

4,478,778

METHOD OF MANUFACTURING FLAT PEELABLE CABLE

Raymond J. Look, Largo, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 332,271, Dec. 18, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 508,700
Int. Cl.³ B29F *3/10*
U.S. Cl. 264—146 **4 Claims**



1. A process for manufacturing a multi-conductor cable of the type having two adjacent cable members each having a plurality of flat parallel linear conductors therein, said cable members being separated by at least one dielectric internal lamina, comprises the following steps:

providing a pair of extruding dies each having a flat recessed conductor aligning surface having an open first end and an open second end opposed to said first end, said surface being flanked by opposed parallel first and second sidewalls extending between said ends, said surface being profiled with a plurality of flat linear recesses extending from said first end to said second end parallel to said sidewalls, each said linear recess being profiled to closely receive a linear conductor therein so it is flush with the respective flat recessed surface, said dies being mateable such that said flat recessed surfaces closely receive said at least one lamina of insulation therebetween, each said die further having a flat recessed extruding surface having an open first end adjacent to said second end of said conductor aligning surface and an open second end opposed to said first end, said extruding surface being flanked by opposed parallel first and second sidewalls aligned with respective first and second sidewalls of said conductor aligning surfaces, said first end of each said extruding surface being separated from said second end of the respective conductor aligning surface by a linear aperture which extends between said first and second sidewalls, said extruding surfaces being parallel to said conductor aligning surfaces and recessed slightly further in said die from the respective conductor aligning surface,

aligning said flat linear conductors in said linear recesses with said at least one lamina of insulation therebetween with said dies mated together,

drawing said linear conductors and said lamina through said dies between said conductor aligning surfaces and said extruding surfaces from said first end of each said die toward said second end,

extruding an insulative plastic melt through said apertures, whereby, said plastic melt forms a dielectric external lamina on either side of said dielectric internal lamina, each said external lamina having a plurality of flat parallel linear conductors therein to form a cable member, said

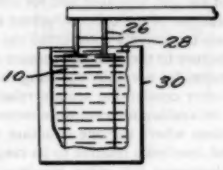
linear recesses assuring a closely controlled spacing of the linear conductors.

4,478,779

ELECTROLESSLY PLATED MOLD SURFACE AND METHOD OF USING

Alexander H. Russell, Owings Mills; John L. McClinton, Hanover, and John A. Sergovic, Severna Park, all of Md., assignors to The Burns & Russell Company, Baltimore, Md.

Filed Aug. 24, 1983, Ser. No. 526,145
Int. Cl.³ B28B 3/00
U.S. Cl. 264—319 17 Claims



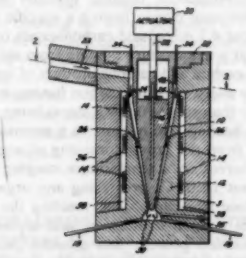
1. In a method of forming an article with a curable resinous composition, the steps comprising: depositing a resinous composition in a mold made of mild steel and having an interior molding surface that has been coated with an electroless deposition layer of a metal that is non-reactive with the resin composition, and the said mold having an exterior surface that has been oxidized, subsequently exposing the mold and composition to heat sufficient to cure the composition, and thereby form the article, and then removing the formed article from the mold.

4,478,780

CONVERGENT HOT CONE PROCESS FOR THERMOSET MOLDING

Wontaik Kim, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 329,444, Dec. 10, 1981, abandoned. This application Feb. 1, 1983, Ser. No. 463,351
Int. Cl.³ B29F 1/00
U.S. Cl. 264—328.2 5 Claims



1. A method for curing thermoset plastic materials comprising:

introducing the thermoset material under pressure into a region between a conical male member and complementarily-shaped female conical member in which male member is disposed so as to define said region therebetween, said introduction occuring at the base end of said conical members, so as to cause said material to flow toward the tip region defined by said conical members;

supplying heat to the volume between said conical members to as to heat said thermoset material to its cure temperature; and

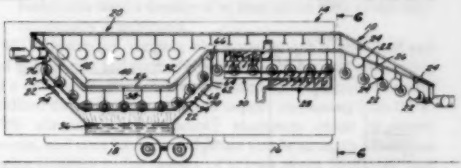
introducing said thermoset material from said tip region into an adjacently disposed mixing chamber, so as to enhance the thermal and material homogeneity of said thermoset plastic.

4,478,781

METHOD AND APPARATUS FOR REFURBISHMENT OF PLASTIC CONTAINERS

Arnold E. Zaelke, 10132 San Luis, Southgate, Calif. 90280

Filed Aug. 30, 1982, Ser. No. 412,912
Int. Cl.³ B29C 25/00
U.S. Cl. 264—341 13 Claims



1. Method of removing surface blemishes from a container made of polycarbonate material, said method comprising the steps of:

heating said container to a temperature approximating the vapor temperature of a selected solvent for said platic material;

subjecting said container to a cooling fluid to cool the external portions of said container to temperatures less than said vapor temperature;

exposing paid external portions of said container to vapors of dichloromethane solvent to heat the exposed surfaces of said container to said vapor temperature, the simultaneous attainment of said vapor temperature by all said exposed surfaces thereby uniformly terminating vapor condensation on and penetration of said exposed surfaces whereby said penetration is of uniform depth throughout said exposed surfaces; and

removing said container from said vapors and allowing said container to cool.

4,478,782

ERASABLE RECORDING MEDIUM COMPRISING A DIMER ACID POLYAMIDE RESIN

James E. Kuder, Fanwood, and Anthony J. East, Madison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 390,162, Jul. 21, 1982, abandoned. This application Sep. 14, 1983, Ser. No. 532,139
Int. Cl.³ G01D 15/34; B29C 25/00
U.S. Cl. 264—345 66 Claims

1. In an ablative recording medium, for use with a recording laser providing light of a predetermined frequency, comprising a thermally stable substrate and a polymer layer coated thereon, the improvement which comprises said polymer layer being comprised of a dimer acid polyamide.

30. An optically readable and erasable information disk comprising a relatively thick and thermally stable substrate having coated thereon a polymer layer comprising an information track comprised of a succession of spaced pits, said polymer layer being comprised of a dimer acid polyamide having a weight average molecular weight in the range of from about 2,000 to about 100,000; a Vicat softening point of from about 30° to 120° C.; a surface tension, measured in dynes/cm, and a melt viscosity, measured in poise, in the temperature range of from about 110° to 200° C. such that the ratio of said surface tension to melt viscosity at some point within said temperature range is at least 0.01; and a temperature for the onset of thermal degradation of at least 250° C.

52. A method of erasing a deformation information pattern of an information medium, which deformation pattern is

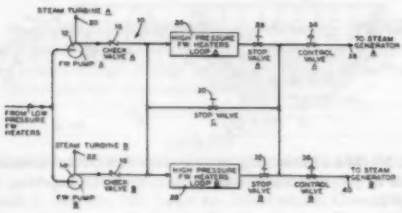
formed in a film deposited on a substrate and with said erasing being achieved by heating said film, the improvement which comprises said film being comprised of a dimer acid polyamide.

4,478,783

NUCLEAR POWER PLANT FEEDWATER CONTROLLER DESIGN

Robert P. Broadwater, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 7, 1981, Ser. No. 327,830
Int. Cl.³ G21C *7/32*
U.S. Cl. 376—211 **4 Claims**



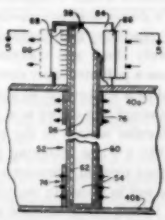
1. A control system for regulating the operation of the components within a power plant feedwater system having various operating modes comprising means for selecting and monitoring the particular mode of operation existing at a specific time from a multiplicity of specific operating modes for the feedwater system, said particular operating mode being dependent upon the operating status of the components within the feedwater system, means for comparing measured feedwater system variables with corresponding predetermined system variables for said particular operating mode, said comparing means producing signals representative of the differences between said measured feedwater system variables and said corresponding predetermined system variables for said particular operating mode, and means for producing control signals in response to said signals produced by said comparing means, said control signals being utilized to regulate the operation of the feedwater system components to control the flow of feedwater therethrough.

4,478,784

PASSIVE HEAT TRANSFER MEANS FOR NUCLEAR REACTORS

James P. Burelbach, Glen Ellyn, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1982, Ser. No. 387,113
Int. Cl.³ G21C *15/18*
U.S. Cl. 376—298 **4 Claims**



1. In a nuclear reactor having components operative to generate reaction heat, means to utilize the reaction heat, and spaced structures including a vessel and a deck for enclosing and isolating the reactor components from a cooler external heat sink, the improved combination therewith of a plurality of heat pipes each having a vaporizing section and a pair of condensing sections, each vaporizing section being disposed in heat transfer relation with one of such structures and one of the pairs of condensing section being in heat transfer relation with another of the structures spaced from the one structure while the other of the condensing sections being in heat transfer relation with the external heat sink, each heat pipe having an exterior housing sealed closed and wick means disposed on the inner faces of the heat pipe housing and a coolant sealed within the heat pipe housing, said coolant being at pressures within the heat pipe housing for vaporizing at the operating temperatures intended for the one structure and for condensing at the operating temperatures of the other structure and of the heat sink, whereby heat is passively transferred via each heat pipe from the one structure to the spaced structure and to the heat sink, enclosure means for normally reducing the effective heat transfer of said other condensing section relative to the heat sink, and means for venting the enclosure means responsive to operating conditions where the one structure approaches the upper limit of and overheats relative to its range of operating temperatures, whereupon the other condensing section becomes operative to provide additional cooling capacity for the heat pipe thereby tending to maintain the structures in the intended range of operating temperatures.

4,478,785

PROCESS OF PRESSURELESS SINTERING TO PRODUCE DENSE, HIGH THERMAL CONDUCTIVITY ALUMINUM NITRIDE CERAMIC BODY

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,158
Int. Cl.³ C04B *35/58*
U.S. Cl. 264—65 **7 Claims**

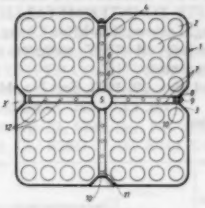
1. A process for producing a sintered body having a density greater than 85% of the theoretical density for aluminum nitride and a thermal conductivity greater than 0.5 W/cm.K at 22° C. which comprises providing at least a substantially uniform particulate mixing consisting essentially of aluminum nitride having a predetermined oxygen content greater than about 0.8% by weight of said particulate aluminum nitride and a carbonaceous additive selected from the group consisting of free carbon, carbonaceous organic material and mixtures thereof, said aluminum nitride having a specific surface area greater than about 4.7 m^2/g, said carbonaceous organic material pyrolyzing at a temperature ranging from about 50° C. to 1000° C. to free carbon and gaseous product of decomposition which vaporizes away, said free carbon having a specific surface area greater than about 40 m^2/g, deoxidizing said particulate mixture by heating said mixture in a nonoxidizing atmosphere selected from the group consisting of argon, nitrogen and mixtures thereof to a temperature ranging from about 1350° C. to about 1750° C. pyrolyzing any organic material therein to produce free carbon and reacting the free carbon therein with the oxygen content of said aluminum nitride producing deoxidized powder and gaseous product which vaporizes away, said free carbon being in an amount which produces a deoxidized powder having an oxygen content ranging from greater than about 0.35% by weight to about 1.1% by weight of said deoxidized powder and which is at least about 20% by weight lower than said predetermined oxygen content, shaping the deoxidized powder into a compact and sintering the compact at ambient pressure in a nonoxidizing atmosphere selected from the group consisting of argon, nitrogen and mixtures thereof at a temperature ranging from about 1900° C. to about 2200° C. producing said sintered body, said compact retaining its oxygen content in an amount greater than about 0.35% by weight of said compact during said sintering, said oxygen content being determinable by neutron activation analysis.

4,478,786

FUEL ASSEMBLY

Ingmar Andersson; Bo Borrman; Bo Fredin, and Olov Nylund, all of Västerås, Sweden, assignors to AB Asea-Atom, Västerås, Sweden

Filed Mar. 3, 1981, Ser. No. 239,933
Claims priority, application Sweden, Mar. 17, 1980, 8002080
Int. Cl.³ G21C *15/02, 3/32*
U.S. Cl. 376—444 14 Claims



1. A fuel assembly for a boiling water reactor, said fuel assembly including a plurality of vertical fuel rods enclosed within a fuel channel separate from said fuel rods, said fuel channel being of substantially rectangular cross-section, wherein said fuel rods are positioned with the aid of a plurality of spacer devices, said fuel channel surrounding an elongated stiffening device for said fuel channel, said stiffening device being separate from said fuel rods and extending along a predominant portion of the length of said fuel rods, the vertical center line of said stiffening device lying in the vicinity of the vertical center line of said fuel channel, said stiffening device having four stiffening wings arranged in vertical planes and having angular distances of about 90° between themselves, said stiffening wings extending along a predominant portion of the length of said fuel rods, each of said stiffening wings being separate from said fuel rods and mechanically connected to the three remaining stiffening wings in the vicinity of said vertical center line of said stiffening device, said stiffening wings being mechanically connected to corresponding walls of said fuel channel to prevent said fuel channel from deforming outwardly during reactor operation, said wings constituting partitions between four bundles of fuel rods and each of said wings comprising at least one vertical internal water passageway extending along said predominant portion of the length of said fuel rods, said internal passageways communicating with at least one inlet opening for water provided at the lower end of said stiffening device, at least one mechanical connection in the vicinity of said vertical center line being in the upper portion of said stiffening device, whereby water while flowing upward through said internal water passageways is prevented from contacting said fuel rods, thus providing a minimized void content and a maximized moderator effect along said internal water passageways.

4,478,787

METHOD OF MAKING DISPERSION STRENGTHENED METAL BODIES AND PRODUCT

Anil V. Nadkarni, Mentor; Prasanna K. Samal, Lyndhurst; James C. Wang, Mentor, all of Ohio, and James E. Sunk, Philadelphia, Pa., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 389,604, Jun. 18, 1982,. This application Dec. 14, 1983, Ser. No. 561,236
Int. Cl.³ B22F *5/00, 7/04*
U.S. Cl. 419—8 43 Claims

1. A process for forming an elongated member of substantially uniform cross-section and comprising a metal sheath surrounding a dispersion-strengthened metal core which comprises the steps of:

(a) providing a sheath-forming metal container,

(b) filling said container with dispersion strengthened metal powder having a particle size less than 20 mesh (Tyler Screen Size) and said dispersion strengthened metal containing from about 0.1% to about 5% by weight of a solute metal as a refractory oxide dispersed therein and having a predetermined tensile strength at full density,

(c) the metal of said container having a tensile strength at room temperature in the cold worked condition no more than about 22% to 25% less than said predetermined tensile strength at full density of said core; and

(d) reducing the cross-sectional area of the powder filled container by application of compressive force to said container in a plurality of reduction stages each in the range of from about 15% to about 35% of the cross-sectional area until a density of at least about 90% of theoretical density is achieved.

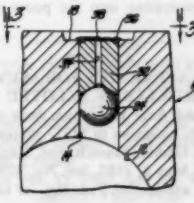
41. A resistance welding electrode having a proximal end and a distal end and formed from a swaged bar and comprising (a) a cylindrical portion characterized by a core of internally oxidized dispersion strengthened copper containing from 0.1 to 4.0% aluminum as refractory aluminum oxide dispersed therein, said core having an ultimate tensile strength developed during swaging to full density of at least about 55,000 psi, said cylindrical portion also having a thin metal sheath surrounding and tightly adhering to said core, said sheath having a cold worked tensile strength at room temperature no more than 15,000 psi below the ultimate tensile strength of said core, said cylindrical body also including a recessed water hole in the proximal end thereof, and (b) a tip portion characterized by converging side surfaces terminating in a circular work-contacting tip, the plan of said circular tip being normal to the longitudinal axis of said electrode.

4,478,788

METHOD OF SEALING A CONTAINER

Walter J. Rozmus, Traverse City, and Jerry L. Dietrich, Williamsburg, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Jul. 19, 1982, Ser. No. 399,932
Int. Cl.³ B22F *3/14*
U.S. Cl. 419—48 9 Claims



1. A method of filling and sealing a container (10) having a cavity (12) therein with a fill passageway (14) extending from the exterior of the container (10) to the cavity (12) thereof by filling the cavity (12) in the container (10) and inserting a first sealing plug (24) having an exterior generally conforming to the interior of said fill passageway (14) into the fill passageway (14) to seal the fill passageway (14), characterized by inserting a second sealing plug (32) with a gas hole (34) therein to allow gas between the first (24) and second (32) plugs to escape as the second plug (32) is inserted into the fill passageway (14) to seal the fill passageway (14).

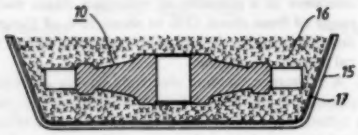
4,478,789
METHOD OF MANUFACTURING AN OBJECT OF METALLIC OR CERAMIC MATERIAL

Jan Adlerborn; Hans Larker, Bertil Mattsson; Jan Nilsson, all of Robertsfors, Sweden, assignor to ASEA AB, Västerås, Sweden

Division of Ser. No. 426,939, Sep. 29, 1982, Pat. No. 4,446,100, which is a continuation of Ser. No. 102,336, Dec. 11, 1979, abandoned. This application Feb. 22, 1984, Ser. No. 582,486

Int. Cl.³ B22F *3/00*

U.S. Cl. 419—49 **3 Claims**



1. A method of manufacturing an object of metallic or ceramic material by the isostatic pressing of a body preformed of a powder of the material with a gaseous pressure medium while sintering said body, said method comprising:

placing said preformed body and an embedding material therefor in an open top vessel which is resistant to the sintering temperature, said embedding material consisting of a glass or a material which forms glass upon heating;

providing a blocking layer arranged around said preformed body, said blocking layer being comprised of finely divided boron nitride or of finely divided glass having a higher melting temperature than the glass in the embedding material, said embedding material being in direct contact with said blocking layer;

transforming said embedding material in the vessel into a melt having a substantially horizontal upper surface limited by the walls of the vessel, said body and the blocking layer therearound being located beneath said surface, said melt presenting a casing that is impermeable to the gaseous pressure medium applied during said isostatic pressing, said transforming being accomplished prior to said isostatic pressing;

isostatically pressing and sintering said body while applying said gaseous pressure medium directly to said upper surface of said melt; and

maintaining the viscosity of the melt at 10^6 poises or less when a pressure is required for isostatic pressing is applied on the melt, said blocking layer preventing glass of the melt from penetrating into the pores of the preformed body.

4,478,790
METHOD AND APPARATUS FOR MANUFACTURING MOLDED ARTICLES OF ALLOYED MATERIAL

Werner Hüther, and Axel Rossmann, both of Karlsfeld, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 373,827

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120501

Int. Cl.³ B22F *3/16*

U.S. Cl. 419—54 **13 Claims**

1. A method of manufacturing a molded article of metal alloy material, comprising the steps of:

providing a granulate mixture of metal alloy powder and a plastic binder, the plastic binder being between 30% and 50% by volume of the mixture,

injection molding the mixture to form a molded article,

subjecting the molded article to a first heat treatment at a temperature no higher than 600° C., in an atmosphere of an inert gas or in a vacuum, to at least partially remove the plastic, carbon remaining in the molded article as a result of this heat treatment,

thereafter subjecting the molded article to a second heat treatment, in an atmosphere of hydrogen, at a pressure of 1–300 bar, and at a temperature of between 400° and 1000° C., to

thereafter sintering the molded article.

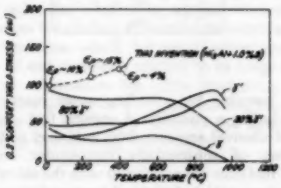
4,478,791
METHOD FOR IMPARTING STRENGTH AND DUCTILITY TO INTERMETALLIC PHASES

Shyh-Chin Huang, Latham; Keh-Minn Chang, and Alan I. Taub, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1982, Ser. No. 444,932

Int. Cl.³ C22C *19/00*

U.S. Cl. 420—590 **24 Claims**



1. The method for achieving both improved high strength and improved ductility in intermetallic phases comprising the steps of:

(a) providing a melt whose composition substantially corresponds to that of a preselected intermetallic phase having a crystal structure of the Ll_2 type, said melt consisting essentially of a first component, a second component and incidental impurities, said melt being modified with boron in an amount of from about 0.25 to 2.0 atomic percent, said first component being at least one element selected from the group consisting of Ni, Fe, Co, Cr, Mn, Mo, W and Re, said second component being at least one element selected from the group consisting of Al, Ti, Nb, Ta, V, Si, Mo, W and Re, said first and second components being present in said melt in an atomic ratio of approximately 3:1, respectively, and

(b) cooling the liquid metal of said melt at a cooling rate of at least about 10^3° C./sec to form a solid body, the principal phase of which is of the Ll_2 type crystal structure in either its ordered or disordered state.

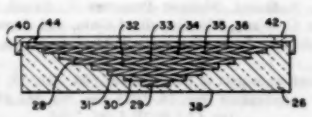
4,478,792
COLORIMETRIC GAS DOSIMETER

Paul W. McConnaughey, and Elmer S. McKee, both of Pittsburgh, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Sep. 16, 1983, Ser. No. 532,682

Int. Cl.³ G01N *21/78, 31/22*

U.S. Cl. 422—56 **5 Claims**



1. A gas dosimeter comprising a stack of superposed porous sheets contained in a housing; the housing having a sidewall, a transparent endwall and means defining an opening opposite the endwall; each superposed sheet is of a larger cross-sectional area than the adjacent underlying sheet, the largest sheet

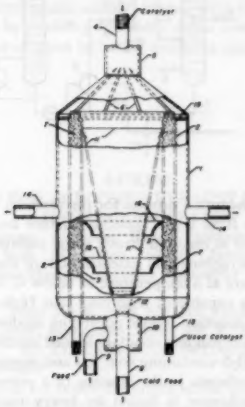
being most remote from the transparent endwall and extending across the cross-sectional area of the opening; and at least each of the porous sheets, except the most remote sheet being impregnated with a reagent that changes color on contact with the gas to be determined.

4,478,793

RADIAL FLOW REACTOR WITH OPERATING TEMPERATURE PROFILE

Anthony G. Vickers, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 22, 1982, Ser. No. 421,629
Int. Cl.³ F28D *21/00*; B01J *8/08*
U.S. Cl. 422—216 **13 Claims**



1. A moving bed radial reactor which comprises:
(a) an enclosed outer vessel comprising a cylindrical outer wall;
(b) an annular form catalyst bed confined within a catalyst retaining system comprising an inner catalyst retention screen and an outer catalyst retention means;
(c) a first fluid outlet means communicating with a first fluid transfer volume located between the outer catalyst retention means and the outer wall of the vessel;
(d) means to maintain a temperature profile along the height of the catalyst bed comprising:
(i) a perforated wall which substantially divides a cylindrical second fluid transfer volume located within the inner catalyst retention screen into a first fluid receiving volume and a second fluid receiving volume, and provides, at one end thereof, for contact of the catalyst with a first fluid only and, at the other end thereof, provides for contact of the catalyst with a second fluid only and between said ends provides for contact of the catalyst with a controlled mixture of said first fluid and said second fluid;
(ii) a first fluid inlet conduit for entry of said first fluid to said reactor having a set temperature communicating with the first fluid receiving volume;
(iii) a second fluid inlet conduit for entry of said second fluid to said reactor having a set temperature different from the temperature of said first fluid communicating with the second fluid receiving volume; and,
(e) means to transfer catalyst downward by gravity flow through the catalyst retaining system.

4,478,794

ROASTING OF MIXED SULPHIDE ORES OR CONCENTRATES

Albert Kruger, Redland, and Richard Healey, Clevedon, both of England, assignors to Metallurgical Processes Limited, Nassau, The Bahamas and I. S. C. Smelting Limited, London, England

Filed Mar. 3, 1983, Ser. No. 471,709
Int. Cl.³ C01G *17/06*; C22B *1/02*
U.S. Cl. 423—89 **5 Claims**

1. A process for roasting a material composed essentially of zinc sulphide and lead sulphide, to give an oxidic product, comprising first incorporating about 2% to 20% by weight of ZnO powder into said material and then forming the material into pellets of about 2 and 15 mm diameter and then roasting these pellets in an oxygen-containing gas in at least two stages, the first stage being at a temperature of about 850° C. to 950° C. and the last stage being at a higher temperature than the first stage, of about 950° C. to about 1050° C.

4,478,795

ALUMINUM TRIHYDROXIDE DELIQUORING WITH ANIONIC POLYMERS

Maryellen Hereda, Budd Lake, and Stephen A. Fischer, South Amboy, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Oct. 18, 1982, Ser. No. 434,934
Int. Cl.³ C01F *7/06*
U.S. Cl. 423—127 **12 Claims**

1. In the Bayer process of deliquoring aluminum trihydroxide slurry of excess sodium ions in the form of caustic liquor by washing and filtering after the precipitation steps, the improvement comprising adding to the slurry an effective amount of anionic polymer selected from the group consisting of homopolymers and copolymers having from about 80 to 100% by weight of anionic vinyl monomer and from about 20 to 0% by weight of nonionic vinyl monomer and a molecular weight of from about 1.5×10^6 to about 12.0×10^6 to improve rate of filtration.

4,478,796

PRODUCTION OF MAGNESIUM OXIDE FROM MAGNESIUM SILICATES BY BASIC EXTRACTION OF SILICA

Jean M. Lalancette, Sherbrooke, and Jean P. Drolet, Neufchatel, both of Canada, assignors to Societe Nationale de Lisiante, Quebec, Canada

Filed Feb. 17, 1983, Ser. No. 467,372
Int. Cl.³ C01F *5/00*
U.S. Cl. 423—155 **6 Claims**

1. A process for replacing the magnesium oxide portion of natural magnesium silicate with sodium oxide thereby to form sodium silicate having a ratio of $Na_2O:SiO_2$ of from 4:1 to 7:1, which comprises melting a natural magnesium silicate and sodium carbonate at a temperature of from 1100° to 1350° C. until a clear melt is obtained, the molar ratio of sodium carbonate to the natural magnesium silicate being from 8:1 to 12:1, quenching and extracting said clear melt with water and separating the insoluble magnesium oxide from the aqueous solution containing predominantly water-soluble sodium silicate and sodium hydroxide.

4,478,797
EXHAUST GAS PURIFICATION

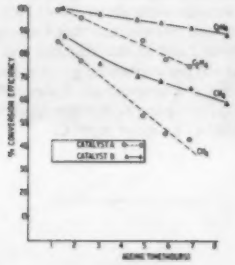
Alan F. Diwell, Reading, and Andrew Salathiel, Wembley, both of England, assignors to Johnson Matthey & Company Limited, London, England

Continuation of Ser. No. 240,235, Mar. 3, 1981,. This application Sep. 23, 1982, Ser. No. 422,145

Claims priority, application United Kingdom, Mar. 10, 1980, 8008068

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—213.5 **13 Claims**



1. A method for the oxidation of exhaust comprising oxygen and products of combustion in a spark ignition internal combustion engine of fuel containing a lead moiety and a lead scavenger, said method comprising passing the exhaust gas through a catalyst consisting essentially of a mixture of one or more platinum group metals, at least some of which is platinum, and WO_3, TiO_2 or $NiMoO_4$ deposited upon a substrate in the form of a monolithic cellular structure made from ceramic or metallic material coated with alumina.

4,478,798
PREVENTION OF CARBONYL FORMATION TO AVOID FOULING OF SOUR GAS ABSORPTION SYSTEM

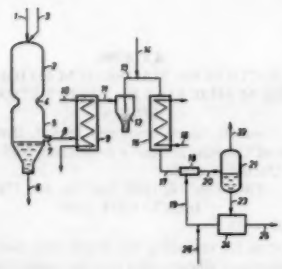
Heinz Karwat, Pullach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 447,820

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148518

Int. Cl.³ C01B *17/16*; B01D *53/34*

U.S. Cl. 423—224 **32 Claims**



1. In a process for avoiding equipment fouling with metallic sulfides comprising the steps of processing and purifying cracked gases containing CO, H_2S and reactive metal species capable of carbonyl formation, the improvement comprising maintaining said reactive metal species capable of carbonyl formation out of contact with equipment parts operating within a temperature range favoring the formation of metal carbonyls to the extent of at least 0.2 mg of metal carbonyl per Nm^3 of gas; and outside of said temperature range, less than 0.2 mg of metal carbonyls per Nm^3 of gas being formable.

4,478,799
CONTROL OF CARBON MONOXIDE PARTIAL PRESSURE IN SOUR GAS ABSORPTION SYSTEM

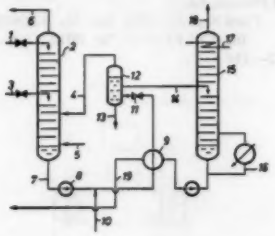
Georg Bengeser, Deining, and Gerhard Ranke, Poecking, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 447,821

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148520

Int. Cl.³ B01D *53/34*; C01B *17/04*

U.S. Cl. 423—224 **12 Claims**



1. In an absorption process for the removal of H_2S-containing sour gas from a raw gaseous mixture containing carbon monoxide and at least one heavy metal carbonyl, said process comprising scrubbing said gaseous mixture under superatmospheric pressure at a temperature of below 0° C. with a scrubbing medium capable of absorbing said H_2S-containing sour gas, heating resultant loaded scrubbing medium in a heat exchanger, and expanding resultant loaded scrubbing medium to liberate the H_2S-containing sour gas and regenerate the scrubbing agent, wherein in the absence of a preventive measure, said heat exchanger is fouled by heavy metal sulfides, the improvement which comprises raising the CO partial pressure, during the heating of the loaded scrubbing medium in said heat exchanger, to above the partial pressure of the CO in equilibrium with the heavy metal carbonyl in the scrubbing medium to avoid decomposition of heavy metal carbonyl into reactive heavy metal and CO, thereby preventing the formation of heavy metal sulfide from the reaction of reactive heavy metal with H_2S.

4,478,800
PROCESS FOR REMOVAL OF SULFUR COMPOUNDS FROM GASES

Willem J. J. van der Wal, Utrecht, and John W. Geus, Bilthoven, both of Netherlands, assignors to VEG Gasinstituut N.V., Apeldoorn, Netherlands

Filed Aug. 4, 1982, Ser. No. 404,929

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131257

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—230 **20 Claims**

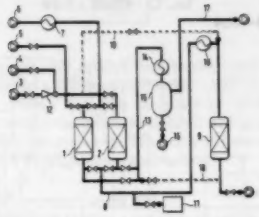
1. A process for removal of hydrogen sulfide, carbonyl sulfide and/or carbon disulfide from gases, comprising:

(a) passing the gas containing hydrogen sulfide, carbonyl sulfide or carbon disulfide, at a temperature of from 5° to 800° C. over an absorption mass including metal oxides which react with the sulfur compound to give metal-sulfur compounds and which metal oxides are present on an inert, refractory support having a specific surface area of more than 10 m^2 per g,

(b) said support being loaded with the metal oxide in an amount of at least 5% by weight, calculated as metal of

the active component and relative to the weight of the support,

(c) at least 20% by weight of the metal oxides on the support being in finely divided form with a particle size of less than 40 nanometers, and



(d) regenerating the support loaded with metal-sulfur compounds by oxidizing said metal-sulfur compounds by passing over of gases including oxidizing agents.

4,478,801

METHOD FOR PURIFYING EXHAUST GASES WITH HYDROGENSULFATES

Hiroo Tominaga, Matsudo; Kaoru Fujimoto, and Tsutomu Shikada, both of Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,891
Claims priority, application Japan, Jul. 9, 1982, 57-118399
Int. Cl.³ C01B *21/00*; B01J *8/00*
U.S. Cl. 423—235 **10 Claims**

1. A process for removing either sulfur oxides or nitrogen oxides or both from exhaust gases containing the same which comprises contacting said exhaust gases, at a temperature of from about 60° C. to 400° C. with a reaction medium containing as a major component at least one molten salt selected from the group consisting of lithium hydrogensulfate, sodium hydrogensulfate, potassium hydrogen sulfate and ammonium hydrogensulfate, in the presence of a vanadium catalyst selected from the group consisting of vanadium oxide, vanadylsulfate, vanadium hydrogensulfate, and vanadates.

4,478,802

METHOD FOR CLEANING CYANIDE-BEARING GAS SCRUBBING WATERS PRODUCED IN METALLURGICAL INDUSTRY

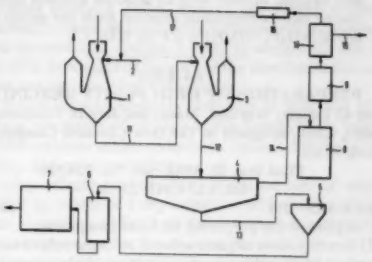
Matti E. Honkaniemi; Veikko A. Juntunen, both of Tornio; Veli J. Keinänen, and Urpo J. Mansikka, both of Kokkokangas, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Sep. 8, 1983, Ser. No. 531,175
Claims priority, application Finland, Sep. 9, 1982, 823130
Int. Cl.³ C21B *13/02*; B01D *13/00, 55/34*
U.S. Cl. 423—236 **9 Claims**

1. A method of treating cyanide-bearing scrubbing waters produced in a metallurgical process, comprising the following steps in the order stated:

(a) conducting the scrubbing water sequentially through a plurality of gas scrubbers that are utilized in the metallurgical process, whereby the scrubbing water is heated and some of the cyanide present in the scrubbing water is driven off from the scrubbing water;

(b) passing the scrubbing water that has been conducted through the gas scrubbers to a clarifier, whereby solid material contained in the scrubbing water is extracted; and



(c) removing scrubbing water from the clarifier and using it to cool solid material received from the metallurgical process, whereby the scrubbing water is further heated and additional cyanide is driven off.

4,478,803

DRY SCRUBBING OF SO_2 FROM MIXTURES

Adolfo R. Zambrano, Hibbing, Minn., assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Feb. 7, 1983, Ser. No. 464,752
Int. Cl.³ B01J *8/00*; C01B *17/00*
U.S. Cl. 423—244 **28 Claims**

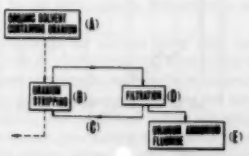
1. A non-catalytic process for removing SO_2 from a feed mixture, which is substantially free of oxygen gas, comprising passing an SO_2-containing feed mixture through an iron-bearing sorbent, said iron-bearing sorbent having a total iron content of at least about 45% by weight, in the presence of a reducing agent, the molar ratio of said reducing agent to SO_2 being about 2-3, under effective reaction conditions to produce at least one sulfur containing iron compound and an effluent having a reduced sulfur content relative to said feed mixture.

4,478,804

RECOVERY PROCESS OF URANIUM

Morio Watanabe, Hyogo, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation, Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,353
Claims priority, application Japan, Sep. 2, 1981, 56-136979
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—259 **3 Claims**



1. A process for the recovery of uranium comprising:

(1) extracting uranium ions with an organic solvent contain-

ing one or more compounds selected from the group consisting of alkyl phosphoric acid, alkyl-aryl phosphoric acid, alkyl dithio phosphoric acid, aryl dithio phosphoric acid, neutral phosphoric acid ester and alkyl amine, together with a petroleum hydrocarbon as a diluent; and

(2) stripping the uranium ions from the resultant organic solvent from step (1) into an aqueous phase by contacting said organic solvent with an aqueous solution comprising one or more compounds selected from the group consisting of NH_4F, NH_4HF_2, KF or KHF_2.

4,478,805

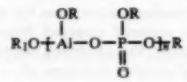
PREPARATION OF HIGH PURITY BERLINITE

Horst G. Langer, Wayland, Mass., and Jere D. Fellmann, Livermore, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 22, 1983, Ser. No. 534,906
Int. Cl.³ C01B *25/36*
U.S. Cl. 423—311 **10 Claims**

1. A process for preparing berlinite comprising:

(1) forming in an organic solvent an organoaluminum phosphate hydrogel having an aluminum to phosphorus atomic ratio of from about 1:1 to about 1:1.2 comprising at least one compound corresponding to the formula:



where each R is hydrogen or R_1, and R_1 is an alkyl, dialkylaminoalkyl or alkoxyalkyl group of up to about 10 carbons;

(2) hydrolyzing the organoaluminum phosphate hydrogel by heating in the presence of water at a pH of less than about 3.0 to thereby form berlinite; and

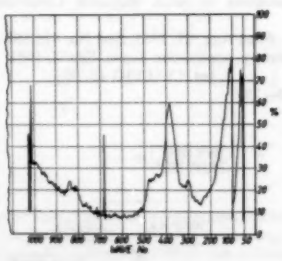
(3) recovering the berlinite.

4,478,806

CRYSTALLINE ALUMINOSILICATES

William J. Ball, Capel; Keith W. Palmer, Weybridge, and David G. Stewart, Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Division of Ser. No. 230,814, Feb. 2, 1981, Pat. No. 4,407,728, which is a continuation-in-part of Ser. No. 969,456, Dec. 14, 1978, abandoned. This application Nov. 22, 1982, Ser. No. 443,317
Claims priority, application United Kingdom, Dec. 23, 1977, 53645/77; Jul. 27, 1978, 31636/78
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—328 **1 Claim**



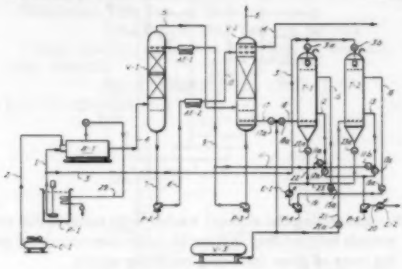
1. A crystalline aluminosilicate having a high silica to alumina molar ratio and an X-ray diffraction pattern substantially the same as ZSM-5 zeolite which does not contain organic nitrogen cations as prepared and which after calcination has the Raman spectrum as shown in FIG. 2.

4,478,807

METHOD FOR MANUFACTURE OF AMMONIUM THIOSULFATE FROM AMMONIA AND SOLID SULFUR OR H_2S RICH GAS STREAM AND/OR BOTH SOLID SULFUR AND H_2S GAS STREAMS

Clifford J. Ott, 10315 Tolman, Houston, Tex. 77034

Filed Sep. 30, 1982, Ser. No. 429,150
Int. Cl.³ C01B *17/64*
U.S. Cl. 423—514 **10 Claims**



1. A process for the preparation of aqueous ammonium thiosulfate which inhibits the formation of sulfides and sulfur by-products which comprises:

reacting SO_2 in a first reaction zone in the presence of a circulating solution of $(NH_4)OH$, $(NH_4)_2SO_3$ and NH_4HSO_3 to remove most of the SO_2, said circulating solution being free of $(NH_4)_2S_2O_3$;

cooling and passing said circulating solution to a second reaction zone along with any remaining SO_2 from the first reaction zone to remove substantially all of said remaining SO_2;

adding an aqueous solution of ammonium hydroxide to said circulating solution in said second reaction zone;

passing said solution to a third reaction zone which is separate from said first and second reaction zones and where liquid sulfur as the sole source of sulfur values is added to said solution in an amount sufficient to provide sulfur in a particulate form suitable for reaction with ammonium sulfite to produce ammonium thiosulfate;

adding ammonia to provide ammonium hydroxide in said third reaction zone in sufficient amounts to bind the SO_2 produced by the equilibrium reaction of ammonium bisulfite to ammonium sulfite, sulfur dioxide and water while maintaining the pH at 5–7; and

removing the ammonium thiosulfate as an at least about 60 wt% solution from said third reaction zone without circulating it to either said first or second reaction zones.

4,478,808

METHOD OF PRODUCING SULPHUR TRIOXIDE

Jury S. Matros; Georgy K. Boreskov; Viktor S. Lakhmostov, all of Novosibirsk; Viktor J. Volkov, Odessa, and Alexei A. Ivanov, Novosibirsk, all of U.S.S.R., assignors to Institut Kataliza Sibirskogo Otdelenia Akademii Nauk SSSR, U.S.S.R.

PCT No. PCT/SU80/00071, § 371 Date Dec. 24, 1981, § 102(e) Date Dec. 24, 1981, PCT Pub. No. WO81/03166, PCT Pub. Date Nov. 12, 1981
PCT Filed May 5, 1980, Ser. No. 336,371
Int. Cl.³ C01B *17/14, 17/98, 17/48*
U.S. Cl. 423—522 **3 Claims**

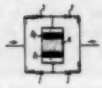
1. Method of producing sulphur trioxide by the oxidation in a stationary catalyst bed of sulphur dioxide contained in a reaction mixture, which comprises

passing a reaction mixture containing sulphur dioxide in a concentration which varies between 0.6–15.0 vol % through a stationary catalyst bed having two ends,

said catalyst bed catalyzing the oxidation of sulphur dioxide to sulphur trioxide and acting as a regenerative heat exchanger,

said reaction mixture being passed at a temperature of 20°–200° C. through one end of said catalyst bed which is at a temperature of 350°–600° C.,

the temperature of said reaction mixture increasing as it



passes through said catalyst bed to the other end of said catalyst bed to a temperature of 350°–600° C., and

periodically during the time intervals of 10–200 minutes while the temperature of said catalyst bed at said one end is decreasing, reversing the direction of flow of said reaction mixture through said catalyst bed.

4,478,809

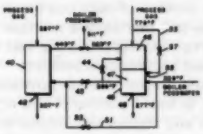
ECONOMIZER ARRANGEMENT

Donald R. McAlister, Ballwin, Mo., and Steven A. Ziebold, Waterloo, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 20, 1983, Ser. No. 459,288

Int. Cl.³ C01B *17/90*; B22B *19/00*

U.S. Cl. 423—522 **8 Claims**



1. A method of optimizing the removal of heat from the heated process gas in a sulfuric acid plant having a converter having first and second sections and interpass and final absorption towers without condensation of vapors while increasing the heat removed from said process gas comprising:

installing first and second economizers, said second economizer having first and second sections for liquid flow;

passing said heated process gas through said first economizer for removal of heat after said first section of said converter and before passing said process gas through said interpass absorption tower;

passing said heated process gas through said second economizer for removal of heat after said second section of said converter and before passing said process gas through said final absorption tower, said process gas passing sequentially through said first and second sections of said second economizer;

passing a liquid stream sequentially through said second section of said second economizer, said first economizer, and said first section of said second economizer for indirect heat exchange with said heated process gas; and

using said second section of said second economizer to preheat said liquid stream before said liquid stream enters said first economizer to prevent any portion of said first economizer from cooling to the dew point of said vapors, preventing condensation of said vapors, and to increase the heat removed from said heated process gas.

4,478,810

METHOD OF TREATING FINAL PRODUCTS FROM FLUE GAS DESULFURIZATION

Wolfgang Bloss, Gummersbach, and Ulrich Mohn, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,484

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135200

Int. Cl.³ C01F *11/46*, *1/00*; C01B *17/00*

U.S. Cl. 423—555 **2 Claims**

1. A method of treating products resulting from a flue gas desulfurization, said method of treating being effective externally of a combustion chamber and for producing an industrially usable calcium sulfate anhydrite construction material comprising in combination the steps of:

at least partially separating out fly ash from the flue gas which is to be desulfurized;

thereupon carrying out desulfurization of flue gas by absorption of sulfur oxide with a lime-containing absorbent to produce products which, prior to any further treatment thereof, contain at least some calcium sulfite therewith, and in particular contain 1–70% be weight fly ash, and 30–99% by weight of the sum of the desulfurization products and residue of said absorbent;

said desulfurization products including at least one of the group consisting of calcium sulfite hemihydrate, calcium sulfite, calcium sulfate dyhydrate, calcium sulfate hemihydrate, and calcium sulfate;

thereafter effecting a reduction of the amount of calcium sulfite by means of a dry oxidation with air of said products to obtain a difficult to dissolve calcium sulfate anhydrite employable for the construction industry;

carrying out said oxidation only at temperatures in a range between 400° C. and 600° C.; and

at least partially meeting the energy requirement necessary for said oxidation by supplying hot flue gases to the dry oxidation.

4,478,811

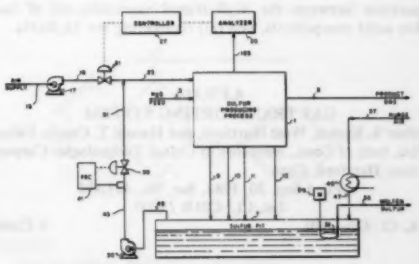
METHOD FOR PREVENTING SULFUR EMISSIONS FROM VESSELS CONTAINING MOLTEN SULFUR

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 13, 1983, Ser. No. 484,650

Int. Cl.³ C01B *17/02*, *17/04*

U.S. Cl. 423—574 R **25 Claims**



1. A method for reducing emissions of sulfur-containing gases from a vessel containing molten elemental sulfur, said molten sulfur having been produced in a process wherein hydrogen sulfide reacts with an oxidant in one or more oxidation reaction zones, said method comprising

(a) introducing a purge air stream into said vessel while the vessel is open to the atmosphere but under a subatmospheric pressure,

(b) removing said purge air stream from said vessel, said removed purge air stream consisting essentially of air and components from said vessel and said components including at least one sulfur-containing component and

(c) while maintaining the removed purge air stream at an elevated temperature preventing substantial formation of solid elemental sulfur, flowing the removed purge air stream into at least one of said oxidation reaction zones, with the removed purge air stream forming a portion of the oxidant required for reaction with the hydrogen sulfide to produce elemental sulfur.

4,478,812

PREPARATION OF MATERIALS

Edward S. Lane, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 12, 1983, Ser. No. 522,694

Claims priority, application United Kingdom, Aug. 13, 1982, 8223389

Int. Cl.³ C01G *19/02*

U.S. Cl. 423—618 **13 Claims**

1. A process for the preparation of a precursor for a tin oxide material by a gel precipitation process which includes contacting together a metal stannate, an organic gelling agent comprising a salt of a polycarboxylic acid and an acidic precipitating agent to form a gel precipitate precursor for a tin oxide material.

4,478,813

PRODUCTION OF COMPLEX BERYLLIUM HYDRIDES

Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 16, 1984, Ser. No. 600,776

Int. Cl.³ C01B *6/24*

U.S. Cl. 423—644 **18 Claims**

1. In a process which comprises subjecting a mixture of beryllium and an alkali metal aluminum complex of the formula

$$MAlR_mH_n$$

wherein M is an alkali metal, R is a hydrocarbyl group, m is an integer from 1 to 4, n is an integer from 0 to 3, the total of m and n being 4, to a pressurized atmosphere of hydrogen and an elevated temperature thereby producing a solid reaction product composed of M_2BeH_4 and other solid components, the improvement which comprises (i) mixing the solid reaction product and an inert liquid diluent having a specific gravity above that of the M_2BeH_4 but below that of essentially all of the other solid components, (ii) effecting in said diluent a separation between the $M_2BeH_4$and essentially all of such other solid components, and (iii) recovering the M_2BeH_4.

4,478,814

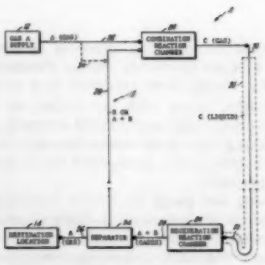
GAS TRANSPORTING SYSTEM

Arthur S. Kesten, West Hartford, and Harold T. Couch, Columbia, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1982, Ser. No. 431,495

Int. Cl.³ C01B *13/00*

U.S. Cl. 423—650 **6 Claims**



1. The method of transporting a first reactant, hydrogen gas, from a supply location to a second location remote from said supply location comprising the steps of:

providing a flow path loop having a combination position and a regeneration position, remote from said combination position, said flow path loop including separate first and second legs extending between said combination and regeneration positions;

providing a supply of hydrogen gas at said supply location external of said flow path loop comprising the step of reacting a hydrocarbon fuel to produce said hydrogen;

conveying said supply of hydrogen gas from said supply location to said combination position of said flow path loop, including introducing said hydrogen gas into said flow path loop at a first location proximate said combination position;

providing a supply of a second reactant in said flow path loop at said regeneration position;

conveying said second reactant from said regeneration position to said combination position through said first leg of said flow path loop;

chemically combining, in a reversible exothermic reaction, said hydrogen gas with said second reactant at said combination position to produce a reaction product in gaseous form;

converting said gaseous-form reaction product to a liquid-form and conveying said liquid-form reaction product to said regeneration position through said second leg of said flow path loop;

regenerating, at said regeneration position, in a chemical reaction the reverse of said combination reaction, said hydrogen gas and said second reactant in gaseous form, said step of regenerating providing said supply of second reactant at said regeneration position;

separating, at said second location proximate said regeneration position, at least a portion of said regenerated hydrogen gas from said regenerated second reactant; and

removing at least a portion of said separated hydrogen gas from said flow path loop at said second location, wherein the rate at which said hydrogen gas is introduced into said flow path loop at said first location is at least as great as the rate of removal of said hydrogen gas from said flow path loop at said second location.

4,478,815

COMPOSITION AND METHOD FOR DETECTING CANCER WITH TECHNETIUM LABELED ANTIBODY FRAGMENTS

Scott W. Burchiel; Buck A. Rhodes, both of Albuquerque, N. Mex., and David R. Crockford, Haverhill, Mass., assignors to Nuc-Med, Inc., Albuquerque, N. Mex. and University Patents, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 89,153, Oct. 29, 1979, Pat. No. 4,311,688. This application Jun. 2, 1981, Ser. No. 269,404

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **13 Claims**

1. A composition of matter comprising a radiolabeled antibody fragment, said radiolabeled antibody fragment being reactive with a second antibody or second antibody fragment which is directly reactive with a tumor specific antigen, said reactivity with said second antibody, or second antibody fragment either being direct or through a series of at least one third antibody or third antibody fragment, the last of said series being directly reactive with said second antibody or antibody fragment, said radiolabel consisting of technetium-99m.

4,478,816

RARE EARTH/CHELATING AGENT COMPLEX FOR DIGITAL FLUOROSCOPY

Robert S. Ledley, Silver Spring, Md., and Edward J. Zapolski, Arlington, Va., assignors to Georgetown University, Washington, D.C.

Filed Jun. 7, 1982, Ser. No. 385,727

Int. Cl.³ A61K *49/04*

U.S. Cl. 424—4 **6 Claims**

1. A method of obtaining diagnostic energy difference image information of a patient, comprising the steps of:

(a) injecting a sterile aqueous solution comprising an effec-

tive amount of a non-radioactive rare earth metal and a chelating agent into the patient intraveneously;

(b) applying an X-ray beam having a first energy level to the paitent to obtain first image information;

(c) applying an X-ray beam having second energy level to the patient to obtain a second image information; and

(d) subtraction processing the first and second image informations to obtain the diagnostic energy difference image information.

4,478,817

DETECTING OR QUANTIFYING SUBSTANCES USING LABELLING TECHNIQUES

Anthony K. Campbell; John S. A. Simpson, both of Cardiff, and James S. Woodhead, Machen, all of Wales, assignors to The Welsh National School of Medicine, Cardiff, Wales

Filed Nov. 14, 1978, Ser. No. 961,389

Claims priority, application United Kingdom, Nov. 17, 1977, 47839/77

Int. Cl.³ G01N *31/00, 31/22, 33/48, 33/54, 33/56*

U.S. Cl. 424—7.1 **20 Claims**

1. A method of detecting or quantifying a substance of biological interest in a body fluid or tissue, in which a labelled binding reagent comprising an antibody, or binding protein, binding specifically to the substance, is linked with a label comprising one or more components which can participate in a luminescent reaction, the labelled binding reagent being immunologically purified and such that it is stable and its properties are not significantly altered by the label, the substance is subsequently contacted with the labelled binding reagent, and a luminescent reaction is subsequently triggered, the emitted light being sensed or measured to provide information concerning the substance of interest.

4,478,818

OCULAR PREPARATION HOUSING STEROID IN TWO DIFFERENT THERAPEUTIC FORMS

John W. Shell, Hillsborough, and Robert M. Gale, Mountain View, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 453,358, Dec. 27, 1982, Pat. No. 4,432,964, which is a continuation of Ser. No. 295,653, Aug. 24, 1981, abandoned, which is a division of Ser. No. 196,608, Oct. 14, 1980, Pat. No. 4,304,765. This application Jan. 5, 1984, Ser. No. 568,480

Int. Cl.³ A61K *9/00, 9/26, 31/565, 31/74*

U.S. Cl. 424—14 **6 Claims**

1. A topically applied composition for treating inflammation of a warm-blooded animal afflicted with same, wherein the composition comprises: a pair consisting essentially of two topically acceptable different physical and chemical therapeutic forms of the same steroid, the pair selected from the group consisting essentially of prednisolone, prednisolone acetate, prednisolone trimethylacetate, prednisolone hemisuccinate, prednisolone phosphate, prednisolone valerate, prednisolone propionate, prednisolone butyrate, prednisolone phenylacetate, 16α-methyl-16α-fluoroprednisolone, 16α-methyl-6α-fluoroprednisolone acetate, 16α-methyl-6α-fluoroprednisolone disodium phosphate, prednisolone-21-N, N-dimethylglycinate, and prednisolone-21-N, N-diethylglycinate, said compositon containing from 0.01% to 10% of each therapeutic form of the same steroid comprising the pair, said pair comprising both forms present in a bioerodible polymeric polyorthoester topical carrier without any interactions, and wherein when the composition is administered topically, the composition administers the steriods by the polyorthoester bioeroding and admi istering the two different forms as a pair, for increasing the concentration of each steroid for topically, with the concentration of each steroid form topically applied being independent of the amount of the different steroid form topically applied from the polyorthoester for increasing the concentration of each steroid form available for passing into the tissues and steroid receptors of a warm-blooded animal in a therapeutically effective amount for treating inflammation over a prolonged period up to 600 hours.

4,478,819

NOVEL ORAL PREPARATIONS

Bernard Hercelin, Clermont; Irene Mary, Le Plessis-Bouchard, and Vien N. Nung, Elisabethville, all of France, assignors to Roussel Reiaf, Paris, France

Filed Apr. 26, 1983, Ser. No. 488,683

Claims priority, application France, Apr. 26, 1982, 82 07137

Int. Cl.³ A61K *9/48, 9/28*

U.S. Cl. 424—37 **12 Claims**

1. An oral pharmaceutical rapid onset capsule, gelule or cachet composition containing an analgesically effective amount of clometacine in the form of extrusion granules whose rapid onset advantages are suppressed if they are compressed into tablets and comprising a mixture comprised of 50 to 70% by weight of clometacine, 5 to 20% by weight of an alkali metal carbonate and an anhydrous excipient for non aqueous granulation.

4,478,820

ANILINO-SUBSTITUTED ISOQUINOLINE QUINONES, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE THEREOF

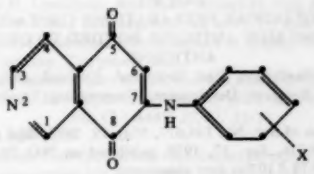
Jerome H. Fleisch, Indianapolis; Winston S. Marshall, Bargersville, and George J. Cullinan, Trafalgar, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 30, 1982, Ser. No. 429,589

Int. Cl.³ A61K *9/12, 31/47;* **C07D** *217/02*

U.S. Cl. 424—45 **10 Claims**

1. A compound of formula (I)



(I)

wherein

X is hydrogen, halo, or C_1–C_3 alkyl.

3. A method of treating an animal, including a human, suffering from or susceptible to any condition characterized by an excessive release of leukotrienes, which comprises administering to said animal a therapeutically-effective amount of a compound of claim 1.

4,478,821

INHIBITION OF BODY ODOR

Angel L. Carrillo, Wellesley, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 26, 1982, Ser. No. 342,860

Int. Cl.³ A61K *7/32, 9/12*

U.S. Cl. 424—47 **4 Claims**

1. A method of inhibiting body odor by applying to the skin an effective deodorant amount of polyhexamethylene biguanide hydrochloride, in a dermatologically acceptable carrier.

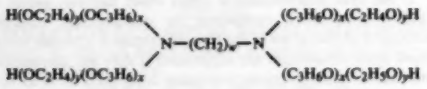
4,478,822
DRUG DELIVERY SYSTEM UTILIZING THERMOSETTING GELS

John L. Haslam; Takeru Higuchi, and Arthur R. Mlodozeniec, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 16, 1983, Ser. No. 495,239
Int. Cl.³ A61K *31/74, 31/70, 31/135, 31/54, 31/415, 31/433, 31/19, 31/66*
U.S. Cl. 424—78 55 Claims

1. An aqueous pharmaceutical composition for rectal, urethral, nasal, vaginal, optical or oral in the buccal pourch administration to a body cavity to treat a condition requiring pharmacological treatment comprising

a. 10% to 50% by weight of a polymer of the formula:



wherein w is an integer of from 2-6 containing approximately 40% to 80% poly(oxyethylene) and approximately 20 to 60% poly(oxypropylene) and having a molecular weight of 7,000 to 50,000; and x and y are any integers within the above constraints; and

b. a pharmacologically effective amount of drug selected from the group consisting of anti-bacterial substances, antihistamines and decongestants, anti-inflammatories, anti-parasitics, antiviral, local anesthetics, antifungal, amebecidal, or trichomonocidal agents, analgesics, antiarthritics, antiasthmatics, anticoagulants, anticonvulsants, antidepressants, antidiabetics, antineoplastics, antipsychotics, antihypertensives, and muscle relaxants and antiprotozoals; and

c. a pharmaceutically acceptable acid or base being in sufficient quantity to adjust the pH of the composition to range from 2 to 9 and wherein the composition is liquid at about room temperature or below.

4,478,823
IMMUNOLOGICAL PREPARATIONS CONTAINING PURIFIED MHC ANTIGENS BONDED TO OTHER ANTIGENS

Arnold R. Sanderson, East Grinstead, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 116,677, May 29, 1979, filed as PCT GB 78/00016, Sep. 27, 1978, published as WO 79/00160, Apr. 5, 1979 § 102(e) date abandoned.
This application Jan. 10, 1983, Ser. No. 456,976
Claims priority, application United Kingdom, Sep. 28, 1977, 40339/77
Int. Cl.³ A61K *39/385, 39/00;* C07G *7/00*
U.S. Cl. 424—88 49 Claims

1. A synthetic immunogenic complex comprising a purified MHC antigen bonded to a second antigen, with the provisos that said second antigen is not a protein with which said MHC antigen is normally associated in nature and is not another MHC antigen.

4,478,824
METHOD FOR ALTERING RED BLOOD CELL FUNCTION AND SURVIVAL

Robert S. Franco, 1825 Sandcliff Dr., Cincinnati, Ohio 45230, and Murray Weiner, 8915 Spooky Ridge La., Cincinnati, Ohio 45242

Filed Aug. 8, 1983, Ser. No. 521,078
Int. Cl.³ A61K *35/18*
U.S. Cl. 424—101 25 Claims

1. A method of introducing desired agents into erythrocyte cells without substantial loss of the contents of the cells and damage to the outer membranes thereof, comprising the steps of:

separating erythrocyte cells from a supply of blood;

suspending and incubating said cells in a solution containing a compound which readily diffuses into and out of said cells, the concentration of said compound being sufficient to ensure diffusion thereof into said cells so that the contents of said cells become hypertonic;

rapidly creating a trans-membrane osmotic gradient by contacting said cells with an essentially isotonic aqueous medium in the presence of a desired agent to be introduced, whereby to cause diffusion of water into said cells with consequent swelling thereof and increase in permeability of the outer membranes of said cells;

maintaining said increase in permeability of said membranes for a period of time sufficient only to permit transport of said desired agent into said cells and diffusion of said compound out of said cells; and

separating and washing said cells whereby to obtain a sterile fraction of substantially intact cells containing intracellular desired agent and substantially devoid of excess water and of other reagents.

4,478,825
WARM ETHANOL METHOD FOR PREPARATION OF LOW FIBRINOGEN ANTIHEMOPHILIC FACTOR

James W. Bloom, Bourbonnais, Ill., assignor to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Oct. 14, 1983, Ser. No. 542,243
Int. Cl.³ A61K *35/16*
U.S. Cl. 424—101 18 Claims

1. A method for producing a substantially fibrinogen-free antihemophilic factor product from a human blood plasma fraction containing as its primary components antihemophilic factor and fibrinogen comprising:

(a) suspending said human blood plasma fraction in a water-ethanol solution containing up to 10% v/v ethanol at room temperature to obtain a solution of low ionic strength;

(b) adjusting the pH of the solution to about 6.0 to 6.8 and cooling the solution to about 5° to 15° C. to form a precipitate comprising fibrinogen and cold-insoluble globulins;

(c) adding a low concentration aluminum hydroxide solution to adsorb trace proteins, blood factors VII, IX, X and prothrombin;

(d) removing the precipitate and said aluminum hydroxide and adsorbed proteins and prothrombin from the solution;

(e) clarifying the solution; and

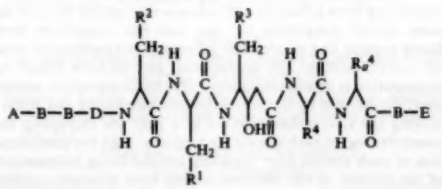
(f) adjusting the pH to about 7.0.

4,478,826
RENIN INHIBITORY PEPTIDES

Daniel F. Veber, Ambler, and Joshua S. Boger, Bryn Mawr, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

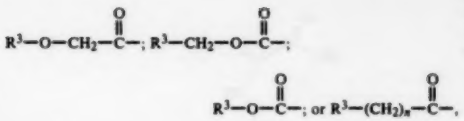
Continuation-in-part of Ser. No. 309,855, Oct. 8, 1981,. This application Sep. 3, 1982, Ser. No. 413,633
Int. Cl.³ C07C *103/52;* A61K *37/02*
U.S. Cl. 424—177 19 Claims

1. A peptide of the formula:



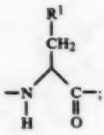
wherein:

A is hydrogen;

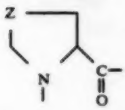


where n is 0 to 5 and R^3 has the same meaning as set out further below, and may additionally be hydrogen;

B is absent; glycyl; sarcosyl; or



D is absent; or



where Z is $(CH_2)_n$ and n is 1 or 2; or —S—;

R^1 is hydrogen; C_{1-4} alkyl; hydroxy C_{1-4} alkyl; phenyl; phenyl mono-substituted with a member selected from the group consisting of methyl, trifluoromethyl, hydroxy, methoxy, fluoro, chloro, bromo, and iodo; indolyl; 4-imidazolyl; amine C_{2-4} alkyl; guanidyl C_{2-3} alkyl; or methylthiomethyl;

R^2 is hydrogen C_{1-4}; alkyl; phenyl; phenyl mono-substituted with a member selected from the group consisting of methyl, trifluoromethyl, hydroxy, methoxy, fluoro, chloro, bromo, and iodo; or indolyl;

R^3 is C_{3-6} alkyl; C_{3-7} cycloalkyl; phenyl; or phenyl mono-substituted with a member selected from the group consisting of methyl, trifluoromethyl, hydroxy, methoxy, fluoro, chloro, bromo, and iodo;

R^4 and R_a^4 are independently hydrogen; or

where R^5 is hydrogen; C_{1-4} alkyl; hydroxy; or C_{3-7} cycloalkyl; and

E is OR; NHR, or $N(R)_2$, where each R may be the same or different and is hydrogen or C_{1-4} alkyl;

wherein all of the asymmetric carbon atoms have an S configuration, except those of substituents B and D, which may also have the R configuration; and a pharmaceutically acceptable salt thereof.

4,478,827

RENIN INHIBITORS

Edgar Haber, Weston, and James Burton, Amesbury, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed May 9, 1983, Ser. No. 492,835

Int. Cl.³ C07C *103/52;* A61K *37/02*

U.S. Cl. 424—177 **6 Claims**

1. A compound of the formula

Z-His-Pro-Phe-His-X-X-Val-Tyr-(D-)-Y

wherein the X's are the same or different and selected from the group consisting of aromatic, an aliphatic and a chlorinated aliphatic amino acid phenylalanine, tyrosine, mono-chloro phenylalanine, leucine, isoleucine, valine and glycine;

Y is selected from the group consisting of lysine, arginine, ornithine, aspartic acid, glutamic acid, and their alpha-carbon esters of lower aliphatic alcohols, and alpha-carbon primary or secondary lower aliphatic amides; and

Z is a proline, hydroxyproline, thioproline or a polyproline residue having up to 5 prolyl residues.

4,478,828

NONAPEPTIDE HAVING IMMUNOSTIMULATIVE ACTIVITY, PROCESS FOR THE PREPARATION THEREOF, AND ITS USE

Wolfgang König, Hofheim am Taunus; Rolf Geiger, Frankfurt am Main; Rainer Obermeier, Hattersheim am Main, and Hubert Müllner, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,589

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224379

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 **4 Claims**

1. Nonapeptide of the formula I

Glu-Asp-Ser-Ser-Ser-Thr-Gly-Trp-Asn-OH (I)

(L-pyroglutamyl-L-aspartyl-L-seryl-L-seryl-L-seryl-L-threonyl-glycyl-L-tryptophyl-L-asparagine) and its physiologically tolerable salts with organic bases, alkali and alkaline earth metal ions.

4,478,829

PHARMACEUTICAL PREPARATION CONTAINING PURIFIED FIBRONECTIN

Ricardo H. Landaburu, Rye Town; Robert H. Yue, Floral Park; David L. Farb, LeGrangeville, all of N.Y., and Bernard N. Violand, Chesterfield, Mo., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 489,624, Apr. 28, 1983, abandoned. This application Mar. 30, 1984, Ser. No. 595,100

Int. Cl.³ A61K *37/02, 35/14*

U.S. Cl. 424—177 **3 Claims**

1. An improved lyophilized fibronectin preparation which is readily reconstitutable with sterile water containing on reconstitution:

1–16 mg/ml of at least 95% pure fibronectin;

0.002M to 0.05M of a physiologically acceptable buffer salt selected from the group consisting of sodium citrate, sodium glycinate, sodium phosphate or tris(hydroxymethyl)amino methane;

0.03M to 0.09M of sodium chloride;

about 2% to 10% w/v of a carbohydrate selected from the group consisting of glucose, galactose, mannose, sucrose, lactose, maltose, mannitol or sorbitol; wherein the improvement comprises the addition of

0.01% to 0.4% w/v of a pharmaceutically acceptable surface active agent selected from the group consisting of (oxy-1,2-ethanediyl)$_{20}$ monododecanoate sorbitan, (oxy-1,2-ethanediyl)$_{20}$ monohexadecanoate sorbitan, (oxy-1,2-ethanediyl)$_{20}$ monooctadecanoate sorbitan, (oxy-1,2-ethanediyl)$_{20}$ mono-9-octadecanoate sorbitan, α[4-(1,1,3,3-tetramethylbutyl)phenyl]-ω-hydroxy(oxy-1,2-ethanediyl)$_{100}$, sodium taurocholate, sodium cholate, sodium deoxycholate, sodium glycocholate and α-hydro-ω-hydroxy(oxyethylene)$_7$(oxypropylene)$_5$-$_4$(oxyethylene)$_7$.

4,478,830

GLYCOSYLATED INSULIN DERIVATIVES

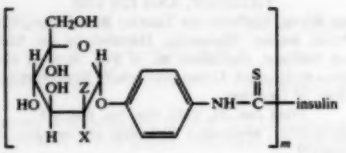
Wan S. Kim, 4512 Jupiter Dr., Salt Lake City, Utah 84117; Seo Y. Jeong, 716 Medical Place N., Salt Lake City, Utah 84112, and James C. McRea, 1876 East 2700 S., Salt Lake City, Utah 84106

Division of Ser. No. 442,362, Nov. 17, 1982, Pat. No. 4,444,683. This application Feb. 6, 1984, Ser. No. 532,917

Int. Cl.[3] A61K *37/26*

U.S. Cl. 424—178 4 Claims

1. A method of depressing the blood sugar level in a diabetic patient which comprises administering to said patient, in a pharmaceutically acceptable carrier, an effective amount of a glycosylated insulin having the formula



wherein Z and X are different and are selected from the group consisting of —H and —OH, and m is an integer of 1 to 3 and wherein each glycosyl group is attached to the insulin by a thioamide linkage through one or more of the α-amino groups of the A-1 glycine, B-1 phenylalanine or ε-amino group of the B-29 lysine moieties of the insulin molecule.

4,478,831

ANTIBIOTICS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Camilla Keller-Juslen; Max Kuhn, and Hamilton D. King, all of Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

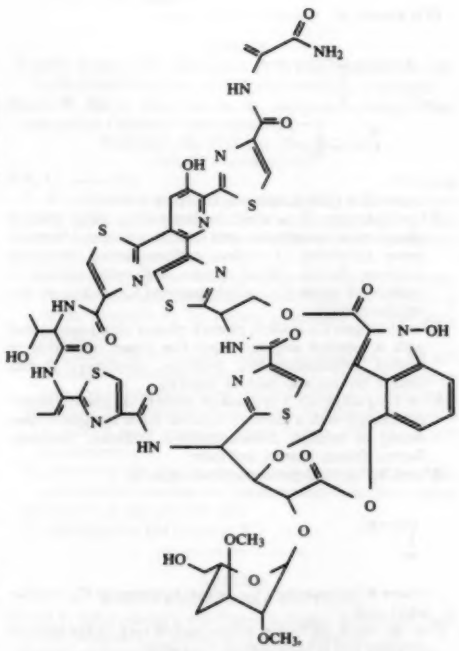
Continuation-in-part of Ser. No. 196,577, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 46,287, Jun. 7, 1979, abandoned. This application May 10, 1982, Ser. No. 376,904

Claims priority, application Switzerland, Jun. 8, 1978, 6282/78

Int. Cl.[3] A61K *31/71*; C07H *17/00*; C12P *19/62*

U.S. Cl. 424—181 6 Claims

1. A compound selected from the group consisting of S 54832/A-I having the structure



S 54832/A-II having the following characterising features:

(i) light yellow when in solid form,

(ii) Analysis (i) C 48.5, H 3.8, N 12.4%, (ii) C 50.3, H 4.3, N 12.4, O 21.7, S 12.0%,

(iii) UV spectrum in acetonitrile see FIG. 4,

(iv) IR spectrum (in KBr) see FIG. 5.

(v) Proton NMR spectrum in DMSO (90 MHz) see FIG. 6, and

(vi) antibiotic activity,

S-54832/A-III having the following characterising features:

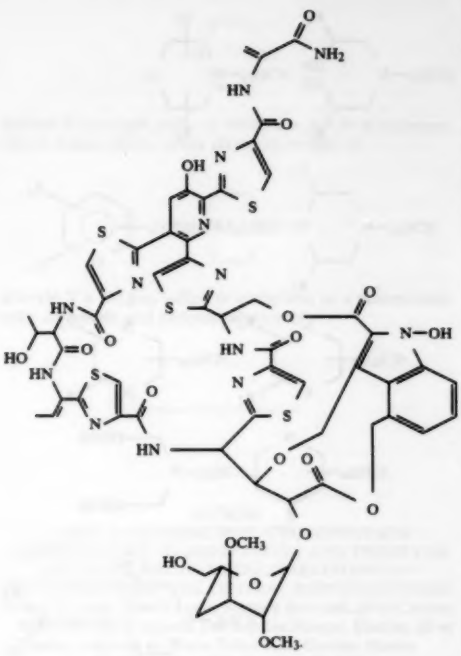
(i) light yellow when in solid form,

(ii) Analysis (1) C 48.1, H 4.1, N 12.3%, (2) C 49.9, H 4.3, N 12.5, S 11.5, O 21.8%,

(iii) UV spectrum in acetonitrile see FIG. 7,

(iv) IR spectrum (in KBr) see FIG. 8, and

(v) antibiotic activity, and S 54832/A-IV having the structure



5. A method of combatting bacteria in hosts which comprises administering a therapeutically effective amount of a compound of claim 1 to a host in need of such treatment.

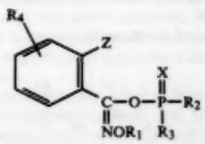
4,478,832

PESTICIDAL O-(N-ALKOXY-SUBSTITUTED-BENZIMIDOYL)-PHOSPHORUS ESTERS AND THIOESTERS

William F. King, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 28, 1982, Ser. No. 393,216
Int. Cl.³ A01N 57/14; C07F 9/165
U.S. Cl. 424—210 21 Claims

1. A compound of the formula:



wherein X is sulfur or oxygen; R_1 is lower alkyl; R_2 is lower alkyl or lower alkoxy; R_3 is lower alkoxy or lower alkylthio; and one of R_4 or Z is hydrogen and the other is trifluoromethyl or cyano.

8. A method of killing insects which comprises contacting said insect or its environment with an insecticidally effective amount of a compound of claim 1.

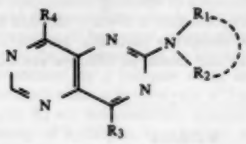
4,478,833

TRISUBSTITUTED PYRIMIDO[5,4-d]PYRIMIDINES AND SALTS THEREOF

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,285
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049207
Int. Cl.³ C07D 401/14, 417/14; A61K 31/505; C07D 487/04
U.S. Cl. 424—246 9 Claims

1. A compound of the formula



wherein

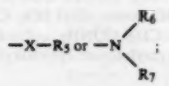
R_1 is straight or branched alkyl of 2 to 8 carbon atoms, optionally substituted in the 2- to 8-position by 1 to 5 hydroxyls; alkyl of 2 to 4 carbon atoms mono-substituted in the 2-, 3- or 4-position by alkoxy of 1 to 3 carbon atoms, amino, (alkyl of 1 to 3 carbon atoms)amino, di(alkyl of 1 to 3 carbon atoms)-amino; methyl; or pyridyimethyl;

R_2 is hydrogen; alkyl of 1 to 3 carbon atoms; or alkyl of 2 to 3 carbon atoms mono-substituted in the 2- or 3-position by hydroxyl or alkoxy of 1 to 3 carbon atoms; or

R_1 and R_2, together with each other and the nitrogen atom to which they are attached, are imidazolyl; thiomorpholino; 1-oxido-thiomorpholino; piperidino; or mono-substituted piperidino, where the substituent is hydroxyl, alkoxy of 1 to 3 carbon atoms, hydroxy(alkyl of 1 to 3 carbon atoms), alkoxycarbonyl of 2 to 4 carbon atoms, amino, (alkanoyl of 1 to 3 carbon atoms)-amino, aminocarbonyl, (alkyl of 1 to 3 carbon atoms)-amino or di(alkyl of 1 to 3 carbon atoms)-amino;

R_3 is thiomorpholino, 1-oxidothiomorpholino or 1,1-dioxidothiomorpholino, each of which is optionally mono- or disubstituted by one or two alkyls of 1 to 3 carbon atoms;

R_4 is



X is sulfur or oxygen;

R_5 is alkyl of 1 to 4 carbon atoms, optionally mono-substituted by phenyl or in the 2-, 3- or 4-position by hydroxyl, di(alkyl of 1 to 3 carbon atoms)-amino, alkoxy of 1 to 3 carbon atoms or alkoxycarbonyl of 2 to 4 carbon atoms; when X is sulfur, also phenyl; where each of the aforementioned phenyl moieties may optionally be methylenedioxy-substituted, mononitro-substituted, or mono- or di-substituted by alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, (alkyl of 1 to 3 carbon atoms)thio, trifluoromethyl and/or halogen; alkyl of 5 to 8 carbon atoms; cycloalkyl of 5 to 7 carbon atoms; furfuryl; indanyl; or naphthylmethyl;

R_6 is hydrogen; alkyl of 1 to 4 carbon atoms; or alkyl of 2 to 4 carbon atoms monosubstituted in the 2-, 3- or 4-position by hydroxyl or alkoxy of 1 to 3 carbon atoms; and

R_7 is hydrogen; alkyl of 1 to 4 carbon atoms; phenyl-(alkyl of 1 to 4 carbon atoms); phenyl; where each of the aforementioned phenyl moieties may optionally be methylenedioxy-substituted or mono- or di-substituted by alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, (alkyl of 1 to 3

carbon atoms)-thio, trifluoromethyl and/or halogen; alkyl of 5 to 8 carbon atoms; cycloalkyl of 5 to 7 carbon atoms; alkyl of 2 to 8 carbon atoms mono-substituted in the 2- to 8-position by hydroxyl, alkoxy of 1 to 3 carbon atoms or hydroxy-(alkoxy of 1 to 3 carbon atoms); cyclohexylmethyl; hydroxycyclohexyl; furfuryl; or pyridyl-methyl; or

R_6 and R_7, together with each other and the nitrogen atoms to which they are attached, are alkyleneimino of 4 to 7 carbon atoms, optionally monohydroxy-substituted or mono- or di-substituted by alkyl of 1 to 3 carbon atoms; tetrahydropyridino; tetrahydroquinolino; or tetrahydroisoquinolino;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

9. The method of preventing or relieving thromboses, arteriosclerosis and metastasis formation in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim 1.

4,478,834

DIHYDROPYRIDINES AND THEIR USE IN THE TREATMENT OF ASTHMA

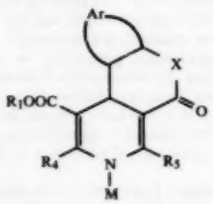
James R. Shroff, Riverside, Conn., and Bernard Loev, Scarsdale, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,849

Int. Cl.[3] **A61K** *31/44*; **C07D** *471/04, 491/052, 495/04*

U.S. Cl. 424—246 **18 Claims**

1. A compound of the structure:



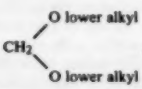
and pharmaceutically acceptable salts thereof, wherein:

Ar is phenyl, naphthyl, heteroaryl, and phenyl mono- or disubstituted by halo, CF_3, NO_2, COOH, COOR, CN, lower alkyl S, lower alkyl SO, lower alkyl SO_2, OCF_3, SCF_3, OC≡CH, $OCH_2CH{=}CH_2$, $CONH_2$, =C=CH—lower alkyl, lower aralkyl, styrryl, lower cycloalkyl having 5 to 7 carbons;

X is S, NH, O, or N—R;

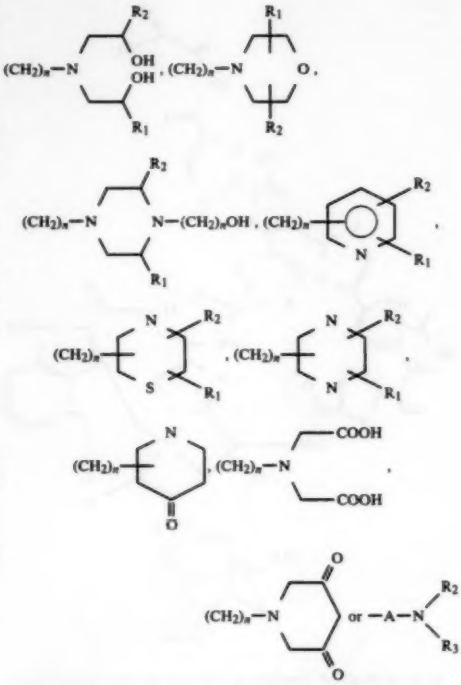
R_1 is H, lower alkyl, aralkyl, aminoalkyl, dialkylamino, aralkylamino, phenylthio, phenyl sulfoxide, phenyl sulfone, alkoxyalkyl, hydroxyalkyl, alkenyl, cycloalkyl or aryl;

R_4 and R_5 are independently lower alkyl, formyl, CN, CH_2OH, dialkylaminomethyl, dialkylaminoethyl,



aryl, aryl lower alkyl,

M is H, alkyl, aryl, alkoxy, $(CH_2)_nCOOR$,



wherein

A is C_2 to C_4 alkyl and may be branched or straight,

R is H or lower alkyl, R_2 and R_3 are independently H, lower alkyl, phenyl or phenyl lower alkyl and when taken together with the nitrogen to which they are attached form a heterocylic ring, and

n is 0–2 inclusive.

4,478,835

SUBSTITUTED IMIDAZO[1,5-c]PYRIMIDINES

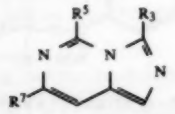
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Aug. 2, 1983, Ser. No. 519,707

Int. Cl.[3] **C07D** *487/04, 413/04*; **A61K** *31/505, 27/00*

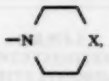
U.S. Cl. 424—246 **17 Claims**

1. A compound of the formula

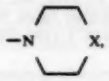


wherein

R_3 is hydrogen, lower alkyl or phenyl; R_5 is chloro, amino, N-(lower)alkylamino, N,N-di(lower)alkylamino, mercapto, phenylthio, benzylthio, lower alkoxy, lower alkylthio or



wherein X is oxygen, sulfur or methylene; and R_7 is hydrogen, chloro, lower alkoxy, lower alkylthio, methyl, or



wherein X is oxygen, sulfur, or methylene; or a pharmaceutically acceptable acid addition salt thereof.

4,478,836

1-ARYL 2-AMINOMETHYL CYCLOPROPANE CARBOXYAMIDE (Z) DERIVATIVES AND THEIR USE AS USEFUL DRUGS IN THE TREATMENT OF DISTURBANCES OF THE CENTRAL NERVOUS SYSTEM

Gilbert Mouzin; Henri Cousse; Bernard Bonnaud, all of Castres; Michel Morre, Toulouse, and Antoine Stenger, Castres, all of France, assignors to Pierre Fabre S.A., Castres, France

Filed Jun. 22, 1982, Ser. No. 390,810

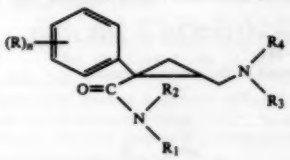
Claims priority, application France, Jun. 23, 1981, 81 12312

Int. Cl.³ C07L *103/82;* **A61K** *31/165*

U.S. Cl. 424—248.54 **16 Claims**

1. A 1-aryl 2-aminomethyl cyclopropane carboxamide (Z) of the formula I:

(I)



in which:

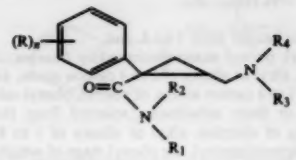
R represents hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, nitro, or amino;

n represents the value 1 or 2; R_1 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl, lower aryl, and lower-alkylaryl, which aryl or alkylaryl group is optionally substituted by a halogen atom, and, with the adjacent nitrogen atom, a heterocycle of 5 or 6 ring members;

R_3 and R_4 are independently selected from the group consisting of hydrogen, lower alkyl, and, together with the adjacent nitrogen atom, a heterocycle of 5 or 6 ring members optionally containing an additional nitrogen or oxygen heteroatom, or a salt thereof with a therapeutically-acceptable inorganic or organic acid.

12. A method of alleviating depression comprising administering to a subject, suffering from depression, an effective anti-depressive amount of a compound which is a 1-aryl 2-aminomethyl cyclopropane carboxamide (Z) of the formula I:

(I)



in which:

R represents hydrogen, halogen, loweralkyl, lower alkoxy, hydroxy, nitro, or amino;

n represents the value 1 or 2;

R_1 and R_2 are independently selected from the the group consisting of hydrogen, lower alkyl, lower aryl, and lower-alkylaryl, which aryl or alkylaryl group is optionally substituted by a halogen atom, and, with the adjacent nitrogen atom, a heterocycle of 5 or 6 ring members;

R_3 and R_4 are independently selected from the group consisting of hydrogen, lower alkyl, and, together with the adjacent nitrogen atom, a heterocycle of 5 or 6 ring members optionally containing an additional nitrogen or oxygen heteroatom, or a salt thereof with a therapeutically-acceptable inorganic or organic acid.

4,478,837

3-HYDRAZINO CYCLOALKYL[c]PYRIDAZINES AS ANTIHYPERTENSIVE AGENTS

Erhard Schenker, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

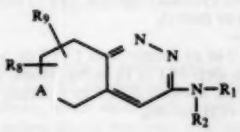
Continuation of Ser. No. 640,633, Dec. 15, 1975, abandoned, which is a continuation of Ser. No. 485,578, Jul. 3, 1974, Pat. No. 3,954,754, which is a continuation-in-part of Ser. No. 251,035, May 8, 1972, Pat. No. 3,838,125. This application Apr. 13, 1979, Ser. No. 29,892

Claims priority, application Switzerland, May 11, 1971, 6951/71; May 11, 1971, 6952/71; May 26, 1971, 7679/71; May 26, 1971, 7683/71; May 28, 1971, 7848/71; May 28, 1971, 7849/71; Oct. 15, 1971, 15120/71; Oct. 15, 1971, 15121/71

Int. Cl.³ C07D *237/28, 237/26;* **A61K** *31/50, 31/495*

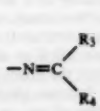
U.S. Cl. 424—250 **17 Claims**

1. A pharmaceutical composition useful in the treatment of hypertension comprising an antihypertensive effective amount of a compound of the formula:



wherein

R_1 is amino or



wherein each of

R_3 and R_4 is alkyl of 1 to 4 carbon atoms, or

R_3 and R_4 together with the carbon atom to which they are bound form cycloalkylidene of 5 to 12 carbon atoms,

R_2 is hydrogen or methyl,

A is $-(CH_2)_n-$

wherein n is 0 or an integer from 1 to 7 or >N—CO—R_5

wherein R_5 is alkyl of 1 to 16 carbon atoms, alkenyl of 3 to

6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, 1-adamantyl, or $-(CH_2)_m-R_6$,

wherein

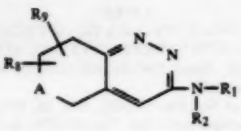
m is 0 or an integer from 1 to 4, and

R_6 is phenyl; phenyl monosubstituted by fluorine, chlorine, bromine, alkyl or alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, or phenyl; phenyl substituted by two or three substituents selected from the group consisting of chlorine, alkyl or alkoxy of 1 to 4 carbon atoms; diphenylmethyl, the phenyl rings of which may be monosubstituted by fluorine, chlorine, bromine, alkyl or alkoxy of 1 to 4 carbon atoms; or naphthyl or $-OR_7$, wherein R_7 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or phenyl or phenyl alkyl which may be monosubstituted on the phenyl ring by chlorine; alkyl or alkoxy or 1 to 4 carbon atoms, and in which the alkylene chain of phenylalkyl is of 1 to 4 carbon atoms, and

R_8 and R_9 are each hydrogen or alkyl of 1 to 4 carbon atoms, provided that when R_6 is phenyl substituted with more than one tertiary butyl or tertiary butoxy, they are on other than adjacent carbon atoms,

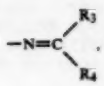
or pharmaceutically acceptable acid addition salts thereof in association with a pharmaceutical carrier.

9. A method of treating hypertension in warm blooded animals which comprises orally administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula



wherein

R_1 is amino or



wherein each of

R_3 and R_4 is alkyl of 1 to 4 carbon atoms, or

R_3 and R_4 together with the carbon atom to which they are bound, form cycloalkylidene of 5 to 12 carbon atoms,

R_2 is hydrogen or methyl,

A is $-(CH_2)_n-$

wherein n is 0 or an integer from 1 to 7 or $>N-CO-R_5$

wherein R_5 is alkyl of 1 to 16 carbon atoms, alkenyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, 1-adamantyl, or $-(CH_2)_m-R_6$,

wherein

m is 0 or an integer from 1 to 4, and

R_6 is phenyl; phenyl monosubstituted by fluorine, chlorine, bromine, alkyl or alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, or phenyl; phenyl substituted by two or three substituents selected from the group consisting of chlorine, alkyl or alkoxy of 1 to 4 carbon atoms; diphenylmethyl, the phenyl rings of which may be monosubstituted by fluorine, chlorine, bromine, alkyl or alkoxy of 1 to 4 carbon atoms; or naphthyl or $-OR_7$, wherein R_7 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or phenyl or phenylalkyl which may be monosubstituted on the phenyl ring by chlorine; alkyl or alkoxy of 1 to 4 carbon atoms, and in which the alkylene chain of phenylalkyl is of 1 to 4 carbon atoms, and

R_8 and R_9 are each hydrogen or alkyl of 1 to 4 carbon atoms, provided that when R_6 is phenyl substituted with more than one tertiary butyl or tertiary butoxy, they are on other than adjacent carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

4,478,838

1-(3,4,5-TRIMETHOXYCINNAMOYL)-4-ALKYLAMINOCARBONYLETHYL PIPERAZINES

Yasuo Itho; Hideo Kato; Eiichi Koshinaka; Nobuo Ogawa; Sakae Kurata, and Kagari Yamagishi, all of Fukui, Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyama-shi, Japan

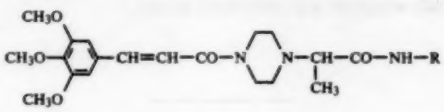
Filed Nov. 15, 1982, Ser. No. 441,635

Claims priority, application Japan, Nov. 19, 1981, 56-184478

Int. Cl.³ A61K *31/495;* **C07D** *241/04*

U.S. Cl. 424—250 **5 Claims**

1. 1-(3,4,5-Trimethoxycinnamoyl)-4-alkylaminocarbonylethyl piperazines represented by the formula:



wherein R is a straight- or branched-chain alkyl group having 1 to 6 carbon atoms or a cycloalkyl group having 5 to 7 carbon atoms, and pharmaceutically-acceptable acid addition salts thereof.

2. A pharmaceutical composition, suitable for use in effecting vasodilation, comprising a compound of claim 1, in an amount effective for such purpose, in association with a pharmaceutically-acceptable carrier.

4,478,839

SUBSTITUTED PYRIMID-2-ONES, THE SALTS THEREOF, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Tore Benneche; Mikkel Gacek, and Kjell Undheim, all of Oslo, Norway, assignors to Nyegaard & Co. A/S, Oslo, Norway

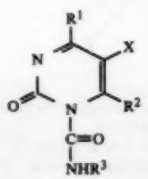
Filed Sep. 10, 1982, Ser. No. 416,670

Claims priority, application United Kingdom, Sep. 11, 1981, 8127505

Int. Cl.³ C07D *239/36;* **A61K** *31/505*

U.S. Cl. 424—251 **9 Claims**

1. A compound of the general formula:



(I)

(wherein X represents a halogen atom or a trifluoromethyl group; R^1 and R^2, which may be the same or different, each represents a hydrogen atom or a C_{1-4} alkyl group; and R^3 represents a hydrogen atom or a C_{1-5} saturated or unsaturated straight or branched aliphatic group; a C_{3-5} saturated or unsaturated cyclic aliphatic group; a C_{1-4} aliphatic group carrying a 5- or 6-membered heterocyclic group having one heteroatom selected from oxygen, nitrogen and sulphur; an aralkyl group in which the alkyl portion contains 1 to 4 carbon atoms and in which the aryl portion contains up to 10 carbon atoms; a 5- or 6-membered heterocyclic group having one heteroatom selected from oxygen, nitrogen and sulphur; or a C_{6-10} carbocyclic aryl group; any of said groups optionally carrying one or more substituents selected from halogen, oxo, hydroxy, mer-

capto, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkanoyloxy and amino) and, where an acidic or basic group is present, the salts thereof.

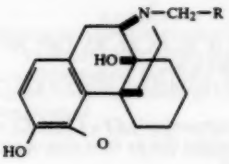
4,478,840

APPETITE SUPPRESSING COMPOSITIONS AND METHODS

Dewey H. Smith, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 11, 1983, Ser. No. 540,763
Int. Cl.³ A61K *31/485*
U.S. Cl. 424—260 **12 Claims**

1. An appetite suppression composition comprising an effective appetite suppressing amount of a compound of Formula I:



(I)

wherein R is cyclopropyl or cyclobutyl; or a pharmaceutically suitable salt thereof together with suitable vehicles and/or excipients therefor.

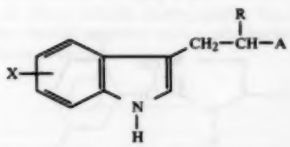
4,478,841

3-[2-(TETRA- AND HEXA-HYDRO-4-PYRIDYL)-ETHYL]-INDOLES AND THEIR USE AS MEDICAMENTS

Francois Audiau, Charenton, and Gérard R. Le Fur, Plessis Robinson, both of France, assignors to Pharmuka Laboratoires, Gennevilliers, France

Filed May 3, 1982, Ser. No. 374,364
Claims priority, application France, May 22, 1981, 81 10218
Int. Cl.³ A61K *31/44, 31/445*
U.S. Cl. 424—263 **4 Claims**

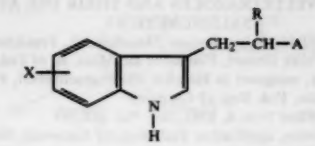
1. A method of treating a mammal afflicted with migraine conditions which comprises administering to said mammal a therapeutically effective amount of a composition containing a compound of the formula:



(II)

wherein R represents hydrogen or alkyl having 1 to 3 carbon atoms, X represents hydrogen or halogen and A represents 1,2,5,6-tetrahydro-4-pyridyl, or R represents alkyl having 1 to 3 carbon atoms, X represents hydrogen or halogen and A represents 1,2,3,4,5,6-hexahydro-4-pyridyl, or a pharmaceutically acceptable salt thereof in a pharmaceutically acceptable carrier therefor.

3. A method of treating a mammal to prevent the formation of arterial thrombi which comprises administering to said mammal a therapeutically effective amount of a composition containing a compound of the formula:



(II)

wherein R represents hydrogen or alkyl having 1 to 3 carbon atoms, X represents hydrogen or halogen and A represents 1,2,5,6-tetrahydro-4-pyridyl, or R represents alkyl having 1 to 3 carbon atoms, X represents hydrogen or halogen and A represents 1,2,3,4,5,6-hexahydro-4-pyridyl, or a pharmaceutically acceptable salt thereof in a pharmaceutically acceptable carrier therefor.

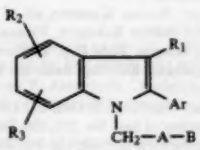
4,478,842

N-SUBSTITUTED-2-PYRIDYLINDOLES

Harris B. Renfroe, West Nyack, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 323,018, Nov. 19, 1981, abandoned. This application Nov. 1, 1982, Ser. No. 437,420
Int. Cl.³ A61K *31/44*; C07D *401/04, 413/14*
U.S. Cl. 424—263 **22 Claims**

1. A compound of the formula



(I)

wherein

R_1 represents hydrogen or lower alkyl;

Ar represents pyridyl unsubstituted or substituted by lower alkyl, carboxy, lower alkoxycarbonyl or carbamoyl;

R_2 and R_3 independently represent hydrogen, lower alkyl, halogen, trifluoromethyl, hydroxy, lower alkoxy, carboxy lower alkyl, lower alkoxycarbonyl lower alkyl, carboxy, lower alkoxycarbonyl, or lower alkyl-(thio, sulfinyl or sulfonyl), or R_2 and R_3 together on adjacent carbon atoms represent lower alkylenedioxy;

A represents straight chain or branched alkylene of 1 to 12 carbon atoms, alkenylene of 2 to 12 carbon atoms, alkynylene of 2 to 12 carbon atoms, lower alkylenephenylene lower alkylene, lower alkylenephenylene, phenylene lower alkylene, phenylene, a direct bond, lower alkylene-(thio or oxy)-lower alkylene, (thio-or oxy)-phenylene, lower alkylene-(thio or oxy)-phenylene, phenylene-(thio or oxy)-lower alkylene or phenylene lower alkenylene;

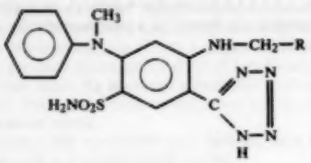
B represents carboxy, lower alkoxycarbonyl, carbamoyl, mono-or di-lower alkylcarbonoyl, formyl, 5-tetrazolyl or hydroxycarbamoyl; or a pharmaceutically acceptable salt thereof.

4,478,843
5-PHENYLTETRAZOLES AND THEIR USE AS SALIDIURETICS

Karl Sturm, Heidesheim; Roman Muschaweck, Frankfurt am Main, and Max Hropot, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,153
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041812
Int. Cl.³ C07D *257/04;* A61K *31/41*
U.S. Cl. 424—269 4 Claims

1. A 5-phenyltetrazole of the formula



wherein R is phenyl, 2-furyl, or 2-thienyl, or a physiologically acceptable salt thereof formed with a base.

3. A method for treating edema in a patient suffering therefrom, which method comprises orally or intravenously administering to said patient a salidiuretically-effective amount of a compound or salt as in claim 1.

4. A method for treating hypertension in a patient suffering therefrom, which method comprises orally or intravenously administering to said patient a salidiuretically-effective amount of a compound or salt as in claim 1.

4,478,844
BRADYCARDIAC OR ANALGESIC 2-(N-(THIENYL-2-METHYL)-N-(2-FLUORO-6-METHYL-PHENYL)-AMINO)-2-IMIDAZOLINE AND SALTS THEREOF

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim, Fed. Rep. of Germany; Walter Kobinger, Vienna, Austria, and Klaus Stockhaus, Bingen, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 313,475, Oct. 21, 1981, abandoned, which is a continuation of Ser. No. 215,106, Dec. 10, 1980, abandoned. This application Oct. 6, 1982, Ser. No. 433,086
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951601
Int. Cl.³ A61K *31/415;* C07D *409/12*
U.S. Cl. 424—273 R 3 Claims

1. 2-[N-(2-Fluoro-6-bromo-phenyl)-N-(thienyl-2-methyl)-amino]-2-imidazoline or a non-toxic, pharmacologically acceptable acid addition salt thereof.

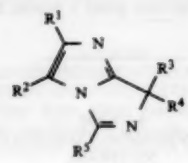
3. The method of slowing the heart rate or raising the pain threshold of a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective bradycardiac or analgesic amount of a compound of claim 1.

4,478,845
ANTIINFLAMMATORY AND/OR ANALGESIC IMIDAZOIMIDAZOLES

Joel G. Whitney, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 19, 1983, Ser. No. 459,189
Int. Cl.³ A61K *31/415, 31/44;* C07D *487/04*
U.S. Cl. 424—273 R 6 Claims

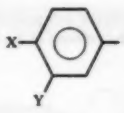
1. A compound having the formula:



(I)

where

R^1 and R^2 are independently pyridyl or



where X is H, F, Cl, Br, R^6, OR^6, NR^6R^7, NO_2 or $R^6S(O)_n$ where n is 0, 1, 2

Y is H, F, or Cl; provided that when y is F or Cl then X must be F or Cl;

R^3 and R^4 are independently CF_3, CF_2H, CF_2Cl, $CFCl_2$, or CF_2CF_3, provided that no more than one of R^3 and R^4 is CF_2CF_3, and

R^5, R^6 and R^7 are independently CH_3 or C_2H_5;

or a pharmaceutically suitable salt thereof.

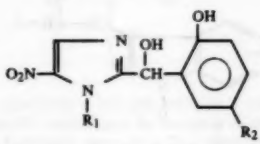
6. A method of treating inflammation, pain or both in a mammal which comprises administering to the mammal an effective antiinflammatory or analgesic amount of at least one compound of claim 1, claim 2, claim 3 or claim 4.

4,478,846
2-(1-ALKYL-5-NITRO)-IMIDAZOLYL-1-(2-HYDROXY-5-ALKYL)-PHENYL CARBINOLS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Pietro T. Tessitore, Via Dante Alighieri, 71, 18038 Sanremo, Italy

Filed Oct. 25, 1983, Ser. No. 545,251
Claims priority, application Italy, Oct. 27, 1982, 23944 A/82
Int. Cl.³ C07D *233/91;* A61K *31/415*
U.S. Cl. 424—273 R 4 Claims

1. 2-(1-alkyl-5-nitro)-imidazolyl-1-(2-hydroxy-5-alkyl)-phenyl carbinols of the general formula:

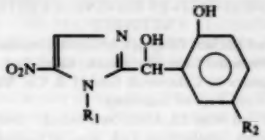


wherein

R_1 represents a straight or branched alkyl radical having from 1 to 4 carbon atoms, or is hydroxyalkyl or chloroalkyl;

R_2 is a straight or branched alkyl radical having from 1 to 6 carbon atoms.

3. Pharmaceutical compositions for the treatment of protozoal infections, of infections caused by anaerobic germs and of infections caused by mycetes, characterized in that they contain a compound of the general formula:



(wherein R_1 represents a straight or branched alkyl radical, having from 1 to 4 carbon atoms, or is hydroxyalkyl or chloroalkyl; R_2 represents a straight or branched alkyl radical having from 1 to 6 carbon atoms) as active ingredient together with pharmaceutically acceptable carriers.

4,478,847

1'-SUBSTITUTED-SPIRO[PYRROLIDINE-3,3'-INDOLINE]-2,2',5-TRIONES

David R. Brittain, Macclesfield, and Robin Wood, Hazel Grove, both of England, assignors to Imperial Chemical Industries PLC, London, England

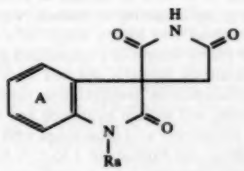
Filed May 11, 1982, Ser. No. 377,135

Claims priority, application United Kingdom, May 12, 1981, 8114397

Int. Cl.³ A61K *31/40;* **C07D** *209/96*

U.S. Cl. 424—274 **9 Claims**

1. A pharmaceutical composition for inhibiting the enzyme aldose reductase comprising as active ingredient an effective amount of a 1'-substituted-spiro(pyrrolidine3,3'-indoline)-2,2',5-trione of the formula:



I

wherein Ra is benzyl bearing two independently selected halogeno substituents located at positions 2 and 4, or 3 and 4, or is benzyl bearing a bromo or trifluoromethyl substituent located at position 3 or 4; and benzene ring A is unsubstituted or bears one or two substituents independently selected from halogeno, (1-4C)alkyl, trifluoromethyl and nitro; or a salt thereof with a base affording a pharmaceutically acceptable cation; or the non-toxic, biodegradable 1-pivaloyloxmethyl precursor thereof; together with a pharmaceutically acceptable diluent or carrier.

4,478,848

COMBATING FUNGI WITH SUBSTITUTED ANILINOMETHYLENE-OXIMES

Wilhelm Brandes, Leichlingen, and Werner Daum, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

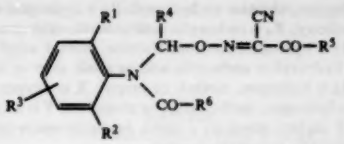
Filed Aug. 2, 1982, Ser. No. 404,087

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133359

Int. Cl.³ A01N *43/08, 37/34, 43/02;* **C07C** *121/52*

U.S. Cl. 424—285 **7 Claims**

1. A substituted anilinomethylene-oxime of the formula



in which

R^1 represents an alkyl or alkoxy group, each having 1 to 4 carbon atoms, or a halogen atom,

R^2 and R^3 independently represent an alkyl group having 1 to 4 carbon atoms or a hydrogen or halogen atom,

R^4 represents a hydrogen atom or a methyl group,

R^5 represents an alkoxy group having 1 to 4 carbon atoms, an amino group or —NH—CO—NHR⁷,

R^7 represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms and optionally substituted by cyano and-/or alkoxycarbonyl having 1 to 4 carbon atoms, or an alkoxyalkyl group having 2 to 5 carbon atoms, and

R^6 represents an alkoxy group having 1 to 4 carbon atoms; an alkyl group having 1 to 6 carbon atoms and optionally substituted by alkoxy, alkylthio, alkylsulphonyloxy, alkylsulphoxy, alkylsulphonyl, alkoxyalkylthio, alkanoyloxy or alkoxyalkoxy, each having 1 to 4 carbon atoms in each alkyl part, propargyloxy, the cyano or thiocyanato group or halogen; an alkenyl group having 2 to 5 carbon atoms, an alkynyl group having 2 to 4 carbon atoms or a cycloalkyl group having 3 to 7 carbon atoms, each optionally substituted by halogen; a phenyl, benzyl or phenylethyl group optionally substituted by halogen, trifluoromethyl, cyano, nitro, methylenedioxy or alkyl, alkylthio or alkoxy each having 1 to 4 carbon atoms; a phenoxymethyl, phenylthiomethyl or phenylthioethyl group optionally substituted by halogen, trifluoromethyl or alkyl; or furyl or furfuryl optionally substituted by alkyl or trifluoromethyl.

3. A method of combating fungi comprising applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

4,478,849

SECONDARY AMINES, THEIR PREPARATION AND USE IN PHARMACEUTICAL COMPOSITIONS

Anthony T. Ainsworth, Cranleigh, and David G. Smith, Redhill, both of England, assignors to Beecham Group Limited, England

Division of Ser. No. 382,379, May 27, 1982, , which is a continuation of Ser. No. 51,440, Jun. 25, 1979, abandoned. This application Mar. 10, 1983, Ser. No. 474,199

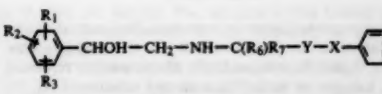
Claims priority, application United Kingdom, Jun. 28, 1978, 28208/78; Nov. 27, 1978, 46215/78

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ A61K *31/24, 31/195*

U.S. Cl. 424—285 **40 Claims**

1. A pharmaceutical composition useful for the treatment of obesity or hyperglycaemia in humans and animals which comprises an anti-obesity effective amount or an anti-hyperglycaemically effective amount of a compound of the formula (II):



(II)

or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, fluorine, chlorine, hydroxy, hydroxymethyl, methyl, methoxyl, amino, formamido, acetamido, methylsulphonylamido, nitro, benzyloxy, methylsulphonylmethyl,

ureido, trifluoromethyl or p-methoxybenzylamino; R_2 is hydrogen, fluorine, chlorine or hydroxyl; R_3 is hydrogen, chlorine or methoxyl; R_4 is carboxylic acid or a salt, ester or amide thereof; R_5 is hydrogen, chlorine, fluorine, methyl, ethyl, methoxyl or hydroxyl or carboxylic acid or a salt, ester or amide thereof; R_6 is hydrogen, methyl, or propyl; X is oxygen or a bond; R_7 is hydrogen, methyl, ethyl or propyl and Y is alkylene of up to 6 carbon atoms or a bond, in combination with a pharmaceutically acceptable carrier.

4,478,850

ESTER

Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-sous-Bois, both of France, and Werner Bonin, Kelkheim, Fed. Rep. of Germany, assignors to Roussel Uclaf, Paris, France

Filed Apr. 28, 1983, Ser. No. 489,516

Claims priority, application France, Apr. 30, 1982, 82 07485

Int. Cl.³ A01N *53/00*; C07C *121/75*

U.S. Cl. 424—304 **14 Claims**

1. (S)α-cayano-3-phenoxy-4-fluoro-benzyl (1R,cis,Z) 2,2-dimethyl-3-[3-oxo-3-tert.butoxy-phenyl]-cyclopropanecarboxylate.

2. A pesticidal composition comprising a pesticidally effective amount of the compound of claim 1 and a pesticidal carrier.

4,478,851

BENZYLIDENE DERIVATIVES AND COMPOSITIONS CONTAINING THEM

Jean-Pierre Kaplan, Chevilly Larue, and Bernard Raizon, Vigneux, both of France, assignors to Synthelabo, Paris, France

Division of Ser. No. 233,404, Feb., 1981, Pat. No. 4,400,536.

This application May 2, 1983, Ser. No. 490,478

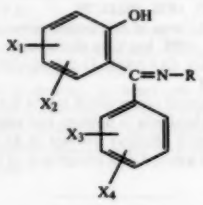
Claims priority, application France, Feb. 12, 1980, 80 03009

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.³ A61K *31/135*; C07C *119/14*

U.S. Cl. 424—330 **6 Claims**

1. A compound of the formula



wherein R represents a linear or branched alkyl radical of 1 to 16 carbon atoms or an alkenyl radical of 2 to 8 carbon atoms, wherein X_1, $X_2$and X_4 independently of one another represent hydrogen, halogen or methyl at least one substituent X_1, X_2 and X_4 being different from hydrogen, and X_3 represents halogen or methyl.

6. A method for providing an anti-convulsant effect to a patient which comprises administering to said patient an effective amount of a compound of claim 1.

4,478,852

UREA DERIVATIVES HAVING A PESTICIDAL ACTIVITY

Heinz-Manfred Becher, Bingen; Christo A. Drandarevski, Ingelheim, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG., Ingelheim am Rhein, Fed. Rep. of Germany

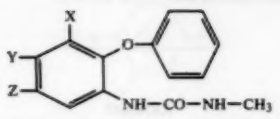
Filed May 12, 1982, Ser. No. 377,598

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120359

Int. Cl.³ C07C *127/19*; A01N *47/28*

U.S. Cl. 424—322 **9 Claims**

1. A compound of the formula



wherein X, Y and Z are each hydrogen or halogen, provided however that at least one of X, Y and Z is halogen.

4,478,853

SKIN CONDITIONING COMPOSITION

James G. Chaussee, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 17, 1982, Ser. No. 378,695

Int. Cl.³ A61K *47/00, 7/00, 7/06, 7/32*

U.S. Cl. 424—358 **3 Claims**

1. A skin conditioner comprising a hydroalcoholic gel comprising from about 35 to 50% by weight of a lower alkanol selected from the group consisting of ethanol, N-propanol and isopropanol; from about 1 to 3% by weight of a silicone oil; from about 0.1 to 1% by weight of a neutralized gelling agent wherein the neutralizing agent is selected from the group consisting of triethanolamine, triethylamine, isopropylamine, potassium hydroxide, and sodium hydroxide and wherein the gelling agent is a polyacrylic acid crosslinked with a polyether of an oligosaccharide; and from about 1 to 15% by weight of a base composition comprising (a) a panthenol moisturizer selected from the group consisting of DL-panthenol, dexpanthenol, calcium pantothenoate, royal jelly, panthethine, pantetheine, panthenyl ethyl ether, pangamic acid, pyridoxin, pantoyl lactone, and vitamin B complex; and (b) (i) an emollient comprising a polyhydric alcohol humectant and (ii) a polyether derivative wherein the weight ratio of moisturizer (a) to emollient (b) is sufficient to to provide effective conditioning and to maintain cutaneous moisture and oil levels.

4,478,854

METHOD OF TREATING PLANT POLYSACCHARIDES

Jens L. Adler-Nissen, Gentofte; Henrik Gürtler, Lyngby; Georg W. Jensen, Bagsvaerd; Hans A. S. Olsen, Vanlose; Steen Riisgaard, Vaerlose, and Martin Schülein, Kobenhavn, all of Denmark, assignors to Novo Industri A/S, Denmark

Continuation-in-part of Ser. No. 334,329, Dec. 24, 1981,. This application May 3, 1983, Ser. No. 491,545

Claims priority, application Denmark, May 6, 1982, 2025/82

Int. Cl.³ C12G *1/00*; C12H *1/00*; C12C *7/00*; A23L *2/34*

U.S. Cl. 426—12 **5 Claims**

1. A process for hydrolyzing plant kingdom polysaccharides which comprises treating a polysaccharide containing plant kingdom substance with an SPS-ase preparation, said SPS-ase being characterized as capable of degrading the water-soluble polysaccharide which binds to soy protein.

4,478,855

PROTEIN CONTAINING FRUIT DRINK AND PROCESS FOR THE MANUFACTURE THEREOF

Anne-Marie Dahlen, and Olof B. S. Strinning, both of Stockholm, Sweden, assignors to Arla, Ekonomisk Forening, Stockholm, Sweden

Continuation-in-part of Ser. No. 334,522, Dec. 28, 1981, abandoned. This application Feb. 4, 1983, Ser. No. 463,546

Int. Cl.³ A23C *9/12, 9/146, 21/02, 21/08;* **A23L** *2/26*

U.S. Cl. 426—41 **7 Claims**

1. A homogenized and pasteurized protein containing fruit juice drink comprising a citrus juice portion or a corresponding amount of citrus aromas in an amount of 10–85% and a milk raw material portion in an amount of 90–15 percent by weight, in which the milk raw material portion includes 0.5–10 percent by weight of whey proteins, said fruit juice drink containing, as a sweetener, 2.5–20 percent by weight of hydrolysed lactose consisting essentially of a salt- and taste-free pure glucose—galactose derivative prepared by dissolving pure lactose crystals, obtained from whey or a permeate from ultrafiltration of milk or whey, in pure water and hydrolysing the lactose solution by means of a cation exchanger, said fruit juice drink further containing 0.05 to 0.2% of a polysaccharide stabilizer comprising galactose derivate or galacturonic acid.

4,478,856

PRODUCTION OF PURIFIED VEGETABLE PROTEIN

Jens L. Adler-Nissen, Gentofte; Henrik Gürtler, Lyngby; Georg W. Jensen, Bagsvaerd; Hans A. S. Olsen, Vanlose; Steen Riisgaard, Vaerlose, and Martin Schulein, Copenhagen, all of Denmark, assignors to Novo Industri A/S, Denmark

Continuation-in-part of Ser. No. 334,330, Dec. 24, 1981,. This application May 3, 1983, Ser. No. 491,546

Claims priority, application Denmark, May 6, 1982, 2025/82

Int. Cl.³ A23J *1/14;* **C07G** *7/00*

U.S. Cl. 426—46 **7 Claims**

1. A method for producing a purified vegetable protein product which comprises treating a solid form vegetable material containing protein in aqueous suspension at the isoelectric point ±1.5 pH units of the vegetable protein with an enzyme composition agent containing pectinase, hemicellulase, cellulase and SPS-ase activity, SPS-ase being characterized as capable of degrading the water soluble polysaccharide which binds to soy protein, said enzyme composition being essentially free from proteolytic activity, and thereafter separating the protein containing solids from the aqueous supernatant.

4,478,857

PROCESS OF MAKING SHELF STABLE, NUTRIENT FORTIFIED CEREAL BASED FOOD

Kirk B. Stauss, Spirit Lake, Iowa, assignor to Global Nutrameal, Inc., Spirit Lake, Iowa

Filed Mar. 28, 1983, Ser. No. 479,258

Int. Cl.³ A23L *1/30;* **A21D** *2/00*

U.S. Cl. 426—72 **5 Claims**

1. A process of making a long shelf life, nutrient fortified cereal based food having a substantially neutral flavor said method comprising:

mixing whole not dehulled, defatted or degermed corn and whole not dehulled, defatted or degermed soybeans at a weight ratio of corn to soybeans of from about 65:35 to about 70:30;

milling said corn and soybean mixture to provide a milled flour mixture;

fortifying with vitamin and mineral nutrients, said flour mixture to a level which will allow the ultimate cooked product to meet daily allowance requirements for nutrition;

moistening said flour to a moisture level of from about 17% to about 20% by weight of moisture;

extruder cooking said moistened, fortified flour at a temperature of from about 290° F. to about 310° F., at a pressure of from about 500 psig to about 1200 psig for up to about 15 seconds to cook and gelatinize said flour; and shaping and drying to a moisture content within the range of from about 3% to about 5%.

4,478,858

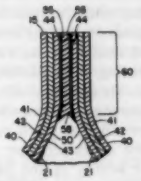
INSTANT COFFEE CONTAINING PACKET AND METHOD OF FORMING

James C. Baird, Cincinnati; Cornelis H. Japikse, Wyoming, and Richard F. Kussin, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 8, 1982, Ser. No. 346,828

Int. Cl.³ B65D *85/00, 81/00, 65/14, 65/40*

U.S. Cl. 426—126 **13 Claims**



1. In combination, a predetermined quantity of particulate soluble coffee product, a predetermined quantity of coffee aroma oil containing aromatic volatiles and a flexible gas and moisture impermeable packet for housing said particulate soluble coffee product and said coffee aroma oil for an extended period of time without substantial degradation in the quality or substantial decrease in the quantity of aromatic volatiles present in said coffee aroma oil and said soluble coffee product so as to present a high coffee aroma impact to the consumer upon opening, said packet comprising at least two layers of a flexible laminate packaging material which is substantially impervious to the passage of gas and moisture, said flexible laminate packaging material comprising an outer layer of paper, an intermediate layer of low density polyethylene bonded to said layer of paper, and an inner surface layer of aluminum foil bonded to said low density polyethylene, said aluminum foil being substantially inert to the aromatic volatiles contained in said coffee aroma oil and said particulate soluble coffee product, said layers of flexible laminate packaging material being superposed on one another so that said coffee aroma oil and said particulate soluble coffee product contained intermediate said layers contact substantially only bare aluminum foil surfaces, said coffee aroma oil being coated onto said bare aluminum foil surfaces, said layers of flexible laminate packaging material being continuously secured to one another about their periphery to form a substantially gas and moisture impervious seal surrounding and totally enclosing said coffee aroma oil and said particulate soluble coffee product.

4,478,859

METHOD OF MAKING STABLE EMULSIFIED MEAT PRODUCTS

Jay B. Fox, Jr., Ambler, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 28, 1982, Ser. No. 382,903

Int. Cl.³ A23B *4/00*

U.S. Cl. 426—266 **8 Claims**

1. A method of making an emulsified meat product stable and resistant to acid deterioration comprising adding to said product in an amount up to 0.5% and then storing the product in an acid medium.

4,478,860

PROCESS FOR IMPROVING THE ORGANOLEPTIC PROPERTIES OF CANNED GREEN VEGETABLES

Ihab M. Hekal, and Paul M. Erlandson, both of Stamford, Conn., assignors to The Continental Group, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 185,034, Sep. 9, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,575

Int. Cl.³ A23B 7/06, 7/14; A23L 3/00

U.S. Cl. 426—267 13 Claims

1. A method of canning green vegetables which normally tend to discolor and develop off-flavors during canning and storage which comprises blanching the vegetables with an alkaline solution having a pH of at least 11, suspending the blanched vegetables in a brine having an alkalinity between about 25 and 75 milliequivalents of hydroxyl ion, hermetically sealing the vegetables in a container in which at least one of the walls thereof in contact with the brine has had applied thereto a water insoluble organic coating material having incorporated therein zinc oxide and an alkaline earth metal material selected from the group consisting of an alkaline earth metal salt, and alkaline earth metal oxide and an alkaline earth metal hydroxide, said coating containing sufficient alkaline earth material so that there is sufficient alkaline earth material contacting the vegetable brine in the container after sterilization to either buffer or reduce the acidity of the packed product during sterilization and subsequent storage so that the pH of the brine during storage is maintained so that discoloration and off-flavor of the green vegetable is prevented and then heating the container at a temperature of about 250° to 300° F. to sterilize the vegetables packaged in the container to an F_o value of at least 6.

4,478,861

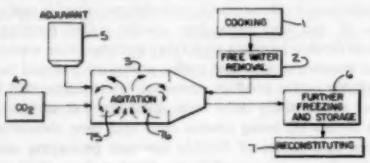
PREPARATION OF A FROZEN FOOD PRODUCT FOR LATER USE

F. Dorsey Montgomery, Milwaukee, Wis., and Allan A. Norin, Chicago, Ill., assignors to Chef Automatique International Ltd., Gibralter

Filed Apr. 19, 1982, Ser. No. 369,926

Int. Cl.³ A23B 7/04, 7/16

U.S. Cl. 426—295 7 Claims



1. The method of preparing a frozen food product comprising the steps of:

(a) cooking a plurality of food pieces in the presence of water,

(b) thereafter removing substantially all of any existing free water present with the cooked food pieces to form voids in the precooked food mass while leaving the mass moist,

(c) then agitating the said moist food mass while subjecting the mass to a freezing gas until the surfaces of the food pieces are partially frozen to rigidify the pieces but leave some unfrozen moisture thereon,

(d) then introducing dry powdered additives to the partially frozen agitating food mass so that the additives uniformly coat and adhere to the said unfrozen moisture on the surfaces of the food pieces,

(e) then continuing the agitation until the coated food pieces are substantially fully frozen throughout,

(f) and subsequently transferring the frozen food pieces to a storage container for later reconstituting by the addition of free water and heat.

4,478,862

HEAT-TREATMENT OF CEREAL

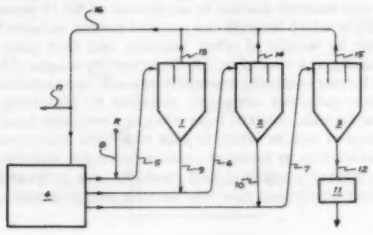
Geoffrey F. Greethead, Killara, Australia, assignor to Geoffrey Greethead Pty. Limited, Killara, Australia

Filed Jan. 26, 1982, Ser. No. 342,638

Claims priority, application Australia, Feb. 26, 1981, PE7764

Int. Cl.³ A23L 1/10; A23B 9/00

U.S. Cl. 426—450 7 Claims



1. A method for rapidly heating a cereal containing water in a stream of hot gas under homogenous heating conditions in at least two cyclones to produce a substantially uniform microporous product, which comprises

generating a stream of hot gas, entraining a cereal in the gas stream, introducing the gas and entrained cereal into a first cyclone wherein the cereal is heat treated by the hot gas, separating the cereal by centrifugal force from the gas, and removing the separated treated cereal and the gas separately from the cyclone,

generating a further stream of hot gas, entraining the treated cereal from the first cyclone in the further gas stream, introducing said further gas stream and heat treated cereal into a second cyclone wherein the cereal is further heat treated by hot gas, separating the twice-treated cereal by centrifugal force from the gas, and removing the separated twice-treated cereal and the gas separately from the second cyclone; said heat treatments being sufficiently rapid to raise the temperature of the cereal to vaporize the water in said cereal to produce a substantially uniform microporous product.

4,478,863

METHOD FOR STEAM PEELING PLANT PRODUCTS

Peter W. C. van der Schoot, Ouderkerk a/d IJssel, Netherlands, assignor to Goudsche Machinefabriek B.V., Gouda, Netherlands

Division of Ser. No. 400,311, Jul. 21, 1982, Pat. No. 4,393,756, which is a continuation of Ser. No. 235,368, Feb. 19, 1981, abandoned, which is a continuation of Ser. No. 104,990, Dec. 18, 1979, abandoned. This application May 4, 1983, Ser. No. 491,150

Claims priority, application Netherlands, Dec. 29, 1978, 7812678

Int. Cl.³ A23N 7/00

U.S. Cl. 426—482 1 Claim

1. A method of steam peeling a plant product selected from the group consisting of potatoes, carrots, celery, red beets, Swedish turnips and apples, comprising the steps of:

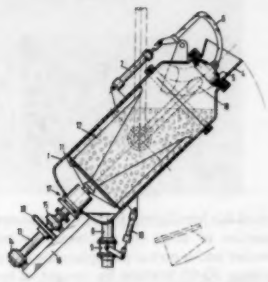
introducing said plant product to be peeled through a product opening at one end of a substantially cylindrical peeling vessel having a liquid discharge outlet at the other end;

tilting the vessel around a horizontal axis into a normally operating longitudinally inclined position wherein the one end is above the other end to a discharge outlet and product opening;

partitioning the vessel at said other end perpendicular to the

longitudinal axis thereof and spaced from the liquid discharge outlet, when the vessel is in the normally operating position, to prevent passage of product to be peeled while allowing condensate to pass therethrough such that the product to be peeled does not lie in the condensate during the application of steam;

applying steam through an access opening in the vessel disposed above the product level while the vessel is in the normally operating position, via a first steam line disposed colinearly with the horizontal tilting axis and a second line connecting the first line to the access opening;



stirring the product during the application of steam by at least one stirring arm disposed above the partitioning and axially along the wall of the vessel and rotating about the longitudinal axis of the vessel to effect the peeling of the plant product;

collecting the condensate below the partitioning and discharging same after the application of the steam; and

tilting the vessel from the horizontal axis from the normally operating position until the other end is above the one end and discharging the peeled product through the product opening.

4,478,864

CONFECTIONS CONTAINING STABILIZED PEPPERMINT OIL

Bernie Blackwell, Laurelton, N.Y.; Shelley Netherwood, Brea, Calif., and Dominick J. Piccolo, Brooklyn, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 450,870, Dec. 20, 1982, Pat. No. 4,440,790. This application Jan. 23, 1984, Ser. No. 570,472

Int. Cl.³ A23G *3/00*; A23L *1/222*

U.S. Cl. 426—534 **15 Claims**

1. A method of flavoring, confectionary, which comprises adding thereto an effective amount of stabilized peppermint oil flavoring agent prepared by reacting the peppermint oil with about 0.5% to about 15% by weight maleic anhydride, based on the weight of peppermint oil to selectively form a menthofuran-maleic anhydride adduct without otherwise affecting the flavoring agent properties of the remaining peppermint oil constituents and recovering the peppermint oil having a reduced menthofuran content.

4,478,865

UTILIZATION OF SULFUR CONTAINING TERPENES AS FLAVORING INGREDIENTS

Edouard P. Demole, Coppet, and Paul Enggist, Geneva, both of Switzerland, assignors to Firmenich SA, Switzerland

Division of Ser. No. 331,014, Dec. 15, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,087

Claims priority, application Switzerland, Dec. 15, 1981, 9513/80

Int. Cl.³ A23L *1/235*

U.S. Cl. 426—535 **3 Claims**

1. The method for enhancing, improving or modifying the fruity organoleptic properties of foodstuffs, beverages and chewing-gums which comprises the step of adding thereto a flavoring effective amount of 1-p-menthene-8-thiol in its racemic or enantiomeric form.

4,478,866

EMULSIFIERS COMPRISING LYSOPHOSPHATIDIC ACID OR A SALT THEREOF AND PROCESSES FOR MAKING A DOUGH CONTAINING SAME

Shigenori Ohta; Seijiro Inoue, both of Tokyo; Takaoki Torigoe, and Makoto Kobayashi, both of Ibaraki, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,646

Claims priority, application Japan, Sep. 18, 1981, 56-147249

Int. Cl.³ A21D *10/00*; C07G *17/00*; B01F *17/00*

U.S. Cl. 426—549 **6 Claims**

1. A process for making a dough for use in the production of farinaceous products which comprises mixing a wheat flour with 0.01–2.0% by weight based on the weight of wheat flour of lysophosphatidic acid or a physiologically compatible salt thereof obtained by treating a mixture of phospholipids with phospholipase D and phospholipase A.

4,478,867

PROCESS FOR WHIPPING AN EMULSION

Frederick A. Zobel, Bedford Hills; Joseph D. Burke, Ossining, both of N.Y., and John T. Oppy, Allentown, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,293

Int. Cl.³ A23C *13/12, 13/14*

U.S. Cl. 426—570 **18 Claims**

1. A process for whipping an homogenized emulsion comprised of fat, protein, emulsifier, stabilizer and water which process comprises:

(a) incorporating gas into said emulsion in a continuous mixer having a mixing pressure of about 45 psig to about 100 psig and a mixing temperature of from about 30° F. to about 50° F.;

(b) pressure reducing said aerated emulsion wherein the pressure is reduced from about a 10 psig reduction to about a 50 psig reduction in a gradual manner;

(c) whipping said pressure reduced gas incorporated aerated emulsion at a whipping pressure of from about 20 psig to about 70 psig and at a temperature of from about 30° F. to about 60° F.; and

(d) pressure reducing said whipped emulsion to an atmospheric pressure wherein the temperature of the whipped emulsion upon reaching atmospheric pressure is from about 46° F. to about 60° F.

4,478,868

FROZEN FOOD PRODUCT AND PROCESS FOR PREPARING

Stephen A. Ariss; John C. Measures, both of Melton Mowbray, and David Barker, Loughborough, all of England, assignors to Mars Limited, London, England

Continuation of Ser. No. 234,853, Feb. 17, 1981, abandoned, which is a continuation of Ser. No. 32,211, Apr. 23, 1979, abandoned. This application Dec. 13, 1983, Ser. No. 560,959

Claims priority, application United Kingdom, Apr. 24, 1978, 16158/78

Int. Cl.³ A23B *4/06*; A23K *1/10*; A23L *1/31*; A23D *3/36*

U.S. Cl. 426—641 **35 Claims**

1. The method of making a frozen food product possessing a quick thaw capability in hot water which includes the steps, prior to freezing, of adjusting the moisture content of the unfrozen food to lower than normal, applying a physiologically tolerable salt or salts to the food in an amount, based on the weight of the product as subsequently frozen, not exceeding 4 percent for any individual salt and 10 percent for a plurality of salts, and thereafter subjecting the food to a freezing

temperature such that its water content is partially frozen and partially unfrozen by virtue of the presence of said salt.

22. A frozen food product possessing a quick thaw capability in hot water, said product having a lower than normal moisture content to enhance its absorptivity of rehydrating water and having dissolved therein physiologically tolerable salt so that the water content of said product is partially frozen and partially unfrozen whereby absorption of hot rehydrating water quickly raises the product temperature by heating the unfrozen water while thawing the frozen water thereby producing food that is warmed, thawed and brought to substantially normal moisture content by brief hot water treatment preparatory to serving.

4,478,869

APPLYING GRANULES TO STRIP ASPHALTIC MATERIAL

Thomas R. Brady, and Lester C. Benner, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 3, 1983, Ser. No. 455,097
Int. Cl.³ B05D 5/02
U.S. Cl. 427—10 **13 Claims**

7. A method for applying granules to continuously moving asphaltic strip material comprising discharging granules onto tacky strip asphaltic material, continuously removing the non-adhered portion of the granules, sensing the amount of removed granules, and controlling the amount of granules discharged onto said asphaltic material in response to the sensed amount of removed granules.

4,478,870

CORONA IMAGE TRANSFER METHOD

Satoshi Haneda, and Masahiko Itaya, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1983, Ser. No. 465,771
Claims priority, application Japan, Feb. 16, 1982, 57-21996; Feb. 16, 1982, 57-21997
Int. Cl.³ G03G 15/048
U.S. Cl. 427—14.1 **13 Claims**

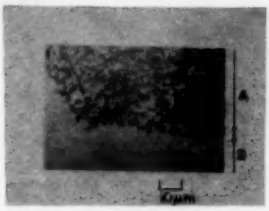
1. A corona discharge method comprising step of supplying corona ion flow having a direct current component with a polarity opposite to an electrification polarity of toner on a transfer material, wherein a density of the ion flow of an incoming area of a corona discharge area is less than that of the ion flow on an outgoing area.

4,478,871

METHOD FOR HARDFACING A FERROUS BASE MATERIAL

Shigeya Sakaguchi; Masaharu Shiroyama, and Hiroshi Ito, all of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 358,749, Mar. 16, 1982, abandoned.
This application Dec. 20, 1983, Ser. No. 563,544
Claims priority, application Japan, Mar. 23, 1981, 56-42750
Int. Cl.³ B05D 1/06, 1/10
U.S. Cl. 427—34 **11 Claims**



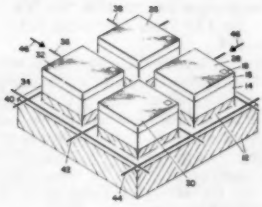
1. A method for hardfacing ferrous base material comprising the combination of steps of: mechanically mixing tungsten carbide powder and a nickel-phosphorous alloy with the mixture comprising 30–95 percent by weight of tungsten carbide with the balance being said alloy; compressing said mixture, heating said mixture to form a sintered body, forming a composite powder from said sintered body, said powder consisting of individual particles of WC and Ni-P alloy of between 200 and 400 mesh in size, spraying said composite powder onto the surface of a ferrous base material, heating said sprayed ferrous base material in a non-oxidizing atmosphere until a liquid phase forms on said material which constitutes a wear-resistant coating thereon; said coating consisting of WC, $W_3Ni_3C(\eta)$ and (Ni-P)-WC solid solution.

4,478,872

METHOD OF MANUFACTURING A MULTILAYER MAGNETO-OPTIC DEVICE

George R. Pulliam, Anaheim, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 4, 1983, Ser. No. 481,914
Int. Cl.³ B05D 3/06
U.S. Cl. 427—38 **20 Claims**



1. A method for raising the anisotropy and Faraday rotation of a magneto-optic device while reducing the threshold of a magnetic field required to switch the direction of magnetization in said device, said method comprising the steps of:

forming a laminate composed of at least one layer of magnetic material having high anisotropy in juxtaposition with at least one layer of magnetic material having low anisotropy;

providing said low anisotropy material layer with a region of magnetic material that has been modified to further decrease the anisotropy of said region relative to the anisotropy of the remainder of said low anisotropy material layer; and

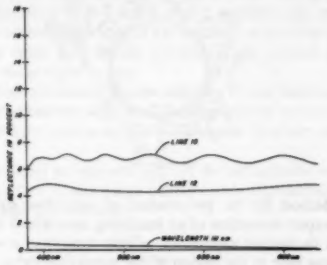
supporting said laminate upon a non-magnetic substrate.

4,478,873

METHOD IMPARTING ANTI-STATIC, ANTI-REFLECTIVE PROPERTIES TO OPHTHALMIC LENSES

Jon D. Masso, Whitinsville, Mass.; William D. Brennan, Woodstock, Conn., and Don H. Rotenberg, Westboro, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 23, 1983, Ser. No. 497,264
Int. Cl.³ B05D 3/06
U.S. Cl. 427—40 28 Claims



1. A method of imparting anti-static properties to a plastic optical element comprising:

(a) overcoating at least one surface of an organic polymeric plastic substrate with a protective organo-silica coating wherein said coating comprises a dispersion of colloidal silica in a lower aliphatic alcohol-water solution, said alcohol-water solution consisting of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said dispersion containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica, 30 to 90 weight percent of the partial condensate, and sufficient acid to provide a pH in the range of 3.0 to 6.0;

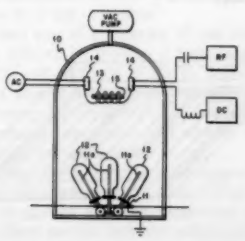
(b) exposing said organo-silica coated plastic substrate to a vacuum glow discharge.

4,478,874

METHODS FOR IMPROVING THE GAS BARRIER PROPERTIES OF POLYMERIC CONTAINERS

Granville J. Hahn, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Dec. 9, 1983, Ser. No. 559,665
Int. Cl.³ B05D 3/14; C23C 11/08
U.S. Cl. 427—40 8 Claims



1. A method for decreasing the gas permeability of containers made of polymeric resins, said method comprising:

placing clean empty polymeric containers in a vacuum chamber;

evacuating a substantial portion of the atmosphere from said chamber;

vaporizing an inorganic oxide material in said chamber;

ionizing said vaporized material; and,

biasing said ionized material to impinge on a substantial portion of the surface of said containers.

7. A method of treating containers to reduce the ingress and egress of gases through the walls thereof, said method comprising:

locating at least one of said containers in a vacuum chamber;

evacuating the atmosphere from said chamber to a vacuum of around 1×10^{-5} Torr;

locating in said chamber a plating material comprising an inorganic oxide;

creating an ionized plasma of said inorganic oxide; and,

biasing said plasma toward said container and impinging it on said container surface.

4,478,875

METHOD FOR THE PREPARATION OF REGENERABLE DIELECTRIC LAYERS THROUGH POLYMERIZATION OF GASES

Horst Pachonik, Taufkirchen, and Gerhard Seebacher, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,584
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224426
Int. Cl.³ B05D 3/06
U.S. Cl. 427—41 5 Claims

1. Method for the preparation of regenerable dielectric layers through polymerization of gases by means of a glow discharge on a substrate, especially for the preparation of electric multilayer capacitors, in which a monomer selected from the group consisting of monomeric perfluoro-hydrocarbons having the empirical formula $(CF_2)_n$, wherein n=2 to 10, and perfluorized cyclic alkanes with 3 to 10 carbon atoms are blown into the glow discharge, the improvement comprising imparting to the dielectric layers resistance to cracking when subjected to immersion soldering by blowing a siloxane or a silazane or a mixture of siloxanes and/or silazanes into the glow discharge region along with the monomers.

4,478,876

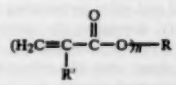
PROCESS OF COATING A SUBSTRATE WITH AN ABRASION RESISTANT ULTRAVIOLET CURABLE COMPOSITION

Rack H. Chung, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 217,719, Dec. 18, 1980, abandoned. This application Jan. 17, 1983, Ser. No. 458,820
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.
Int. Cl.³ C08F 2/50
U.S. Cl. 427—54.1 23 Claims

1. A process for providing a mar resistant tenaciously and durably adhered hard coating onto the surface of a solid substrate comprising:

I. applying a thin layer of a coating composition onto the surface of said solid substrate, said coating composition being comprised of (A) at least one polyfunctional acrylate monomer represented by the general formula



wherein n is an integer having a value of from 1 to 4, and R is selected from the group consisting of a n valent aliphatic

hydrocarbon residue, a n valent substituted aliphatic hydrocarbon residue containing at least one ther linkage, and a n valent substituted aliphatic hydrocarbon residue containing at least one ether linkage, R′ is selected from hydrogen or lower alkyl radicals; (B) colloidal silica; (C) at least one acryloxy functional silane of the formula

wherein R^4 is a monovalent hydrocarbon radical, R^5 is a divalent hydrocarbon radical, R^6 is selected from the group consisting of hydrogen atoms and monovalent hydrocarbon radicals, x is an integer of from 1 to 4 inclusive; (D) a photoinitiator comprised of a blend of (i) one or more ketones and (ii) one or more hindered amines; and

II. exposing said coated substrate under a non-inert atmosphere to ultraviolet light for a period of time sufficient to polymerize and crosslink said polyfunctional acrylate monomers, thereby forming said hard coating.

4,478,877

PROCESS FOR THE PREPARATION OF SUPERCONDUCTING COMPOUND MATERIALS

Berthold Krevet, Dettenheim-Liedolsheim; Wolfgang Schauer, Pfinztal, and Fritz Wüchner, Germersheim, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Division of Ser. No. 246,050, Mar. 20, 1980, Pat. No. 4,386,115. This application Sep. 30, 1982, Ser. No. 432,376

Claims priority, application European Pat. Off., Mar. 27, 1980, 80101648.6

Int. Cl.³ C23C *11/02, 13/02*; H01L *39/12*

U.S. Cl. 427—62 **12 Claims**

1. In a process for the preparation of a composite material containing a substrate and a metallic layer of a metastable or unstable phase strongly adhering to the substrate surface, the layer containing more than one elemental component, and being deposited onto the substrate from the gas or vapor phase to a desired thickness, the improvement comprising:

(a) using very pure components for formation of the metastable or unstable phase, having respective impurity concentrations of less than 100 ppm, by weight;

(b) effecting an initial deposition of the layer to a layer thickness of about 5 to 20 nm by simultaneously depositing the components on the substrate, while reducing the mobility of the components on the substrate to thereby promote germination of a subsequently deposited metastable or unstable phase formed by the components, the reduction of mobility being effected by adding a specific impurity, selected from the group consisting of oxygen and oxygen-containing compounds, to the components; and

(c) providing the substrate containing the initially deposited layer with a temperature at which a metastable or unstable phase is formed and, after terminating the addition of the specific impurity, depositing the components for the remainder of the layer up to the desired thickness, from the gas or vapor phase onto the substrate to produce the subsequently deposited phase.

5. Process according to claim 1 wherein said layer comprises Nb_3Ge in the A15 phase.

4,478,878

METHOD FOR THE PREPARATION OF METAL-FREE STRIPS IN THE METAL VAPOR DEPOSITION OF AN INSULATING TAPE

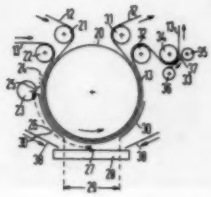
Anselm Neuwald, Bad Abbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,478

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134589; Jun. 29, 1982, 3224234

Int. Cl.³ C23C *13/02, 13/04*

U.S. Cl. 427—79 **6 Claims**



1. Method for the preparation of metal-free strips in the metal vapor deposition of an insulating tape which is intended for use in electric capacitors, which comprises covering the insulating tape in the region of the metal-free strips to be prepared, by an endless cover tape having a top, bottom and lateral surfaces, only the bottom surface of which rests against the insulating tape, causing the cover tape to travel along with the insulating tape at the same velocity, coating the cover tape with oil on the side to be exposed to metal vapors from metal in a vapor deposition zone before entering said vapor deposition zone, subjecting the oil coated cover tape and insulating tape on which the cover tape rests to metal vapor deposition by passing them through the vapor deposition zone, after traversing the vapor deposition zone separating the cover tape and the insulating tape to go their different ways, freeing the separated cover tape of vapor-deposited metal by stripping it off, the combination therewith of bringing the insulating tape and the cover tape into contact with each other, and while the two tapes are in contact applying by vapor deposition of oil an oil film which covers the top and lateral surfaces of the cover tape as well as slightly adjacent areas of the insulating tape, and thereafter effecting said metal vapor deposition.

4,478,879

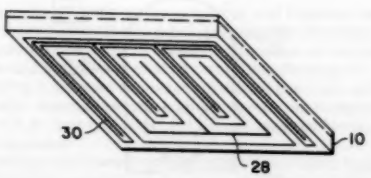
SCREEN PRINTED INTERDIGITATED BACK CONTACT SOLAR CELL

Cosmo R. Baraona, Parma; George A. Mazaris, Brookpark, and An-ti Chai, North Ridgeville, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 10, 1983, Ser. No. 465,364

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—85 **3 Claims**



1. In a method of making an interdigitated back contact solar cell of the type having both a first junction and a second junc-

tion adjacent to the nonilluminated back surface of a semiconductor substrate in a pair of interdigitated patterns with a uniform spacing therebetween, the improvement comprising

forming an opening having a predetermined area in a first screen, said opening having a configuration corresponding to one of said patterns,

positioning said first screen adjacent to said back surface of said substrate,

screen printing one type of dopant material onto said back surface of said substrate in said first configuration and diffusing the same into said substrate,

forming another opening having another area in a second screen, said other opening having another configuration corresponding to the other of said patterns, the ratio of said predetermined area of the opening in the first screen to said other area of the opening in the second screen being about eight to one,

positioning said second screen adjacent to said back surface of said substrate so that said other pattern is uniformly spaced from said one pattern a distance of about one mil, and

screen printing an opposite type of dopant material on said back surface in said other configuration and diffusing the same onto said substrate.

4,478,880

METHOD OF FABRICATING POLYCRYSTALLINE SILICON STRIPS

Christian Belouet, Sceaux, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Jun. 27, 1983, Ser. No. 507,651
Claims priority, application France, Jun. 25, 1982, 82 11171
Int. Cl.³ B05D *5/12*; H01L *31/18*
U.S. Cl. 427—86 **6 Claims**

1. A method of fabricating a polycrystalline silicon strip of photocells, comprising:

a first step of moving a carbon ribbon substrate in a substantially horizontal direction and preheating said substrate to a temperature substantially the same as the melting point of silicon, and

a second step of depositing silicon on the top face of the substrate so as to form a uniformly thick layer of molten silicon on said substrate while a vertical temperature gradient is maintained to cause a gradual cooling of the silicon layer from top to bottom,

and wherein said step of preheating of said carbon ribbon substrate is effected by moving it lengthwise through a first oven (7) and said step of silicon deposition is performed in a second oven (9), and wherein said carbon ribbon is conveyed through both said ovens one after the other in a neutral atmosphere, and wherein said fabrication method further comprises

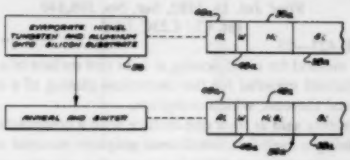
a third step, immediately following the second, deposition step and the ribbon's leaving the second oven (9), of burning away the carbon substrate supporting the layer of deposited silicon so that only the polycrystalline silicon strip remains, and then subjecting said silicon strip to a deoxidizing step within a deoxidizing station by plasma processing.

4,478,881

TUNGSTEN BARRIER CONTACT

Meir Bartur, and Marc Nicolet, both of Pasadena, Calif., assignors to Solid State Devices, Inc., La Mirada, Calif.

Filed Dec. 28, 1981, Ser. No. 334,561
Int. Cl.³ H01L *21/285*
U.S. Cl. 427—90 **7 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

depositing a first metal layer onto a silicon substrate;

depositing a second metal layer onto the first metal layer, selected from the group consisting of tungsten, tantalum and hafnium;

depositing an aluminum contact onto the second metal layer; and thereafter

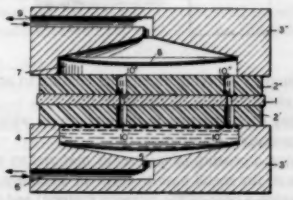
heating the substrate and metal layers on the substrate concurrently to anneal the first metal layer and the silicon substrate to form a silicide and also to sinter the aluminum contact in a single step, wherein the second metal layer prevents the aluminum from chemically reacting with the silicide during the single annealing and sintering step.

4,478,882

METHOD FOR CONDUCTIVELY INTERCONNECTING CIRCUIT COMPONENTS ON OPPOSITE SURFACES OF A DIELECTRIC LAYER

Scorta Roberto, Milan, Italy, assignor to Italtel Societa Italiana Telecomunicazioni S.P.A., Milan, Italy

Filed Jun. 3, 1982, Ser. No. 384,499
Int. Cl.³ H05K *3/40*
U.S. Cl. 427—97 **4 Claims**



1. A method of conductively interconnecting aligned points of circuit components on opposite surfaces of a dielectric layer, comprising the steps of:

(a) providing said layer with a bore extending between said aligned points;

(b) sandwiching said layer between an upper mask and a lower mask each having a perforation in line with said bore;

(c) clamping said masks and said layer between two members having an upper chamber and a lower chamber in communication with said perforations;

(d) filling said lower chamber with a pool of an electrically conductive flowable mass; and

(e) pressurizing said lower chamber while simultaneously applying suction to said upper chamber to drive some of said mass from said pool upward through said bore via said perforations with resulting conductive bridging of the ends of said bore by a solid plug.

4,478,883

CONDITIONING OF A SUBSTRATE FOR ELECTROLESS DIRECT BOND PLATING IN HOLES AND ON SURFACES OF A SUBSTRATE

James R. Bupp; Voya Markovich, both of Endwell; Tracy E. Napp, Vestal, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,140
Int. Cl.³ C23C 3/02
U.S. Cl. 427—97 27 Claims

1. A method for conditioning at least one surface of a dielectric substrate material for the electroless plating of a conductive metal thereon, which comprises:

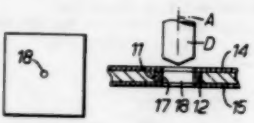
contacting said at least one surface with a composition containing a multifunctional ionic polymer material containing at least two available ionic moieties, wherein said ionic moieties are of a charge opposite from the charge associated with the colloidal catalyst particles to be subsequently applied to the substrate to provide for electrostatic attraction of said colloidal catalyst particles, and then activating the surface by contacting it with a composition containing a colloidal catalyst to provide directly or as a precursor leading to catalytic sites capable of electroless plating initiation of a conductive metal thereon.

4,478,884

PRODUCTION OF VITREOUS ENAMELLED SUBSTRATES

Allan F. Barnes, London, England, and Clarence L. Wallace, San Marcos, Calif., assignors to Cookson Group plc, London, England

Filed Dec. 3, 1982, Ser. No. 446,695
Claims priority, application United Kingdom, Dec. 4, 1981, 8136652
Int. Cl.³ B05D 5/12
U.S. Cl. 427—97 12 Claims



1. A method of applying an enamel coating to an apertured metal base characterized by the steps of:

(i) plugging each aperture in the metal base with an electrically-insulating material;

(ii) applying a coating of a vitreous material to at least one surface of the metal base to form an assembly;

(iii) removing a core of the vitreous material and the insulating material from around the longitudinal axis of each aperture to leave each aperture lined with the insulating material, and

(iv) firing the assembly obtained in step (iii).

4,478,885

SURFACE TREATING AGENT

Takeo Kuramoto, Kanagawa, Japan, assignor to W. R. Grace K.K., Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 506,158
Claims priority, application Japan, Jan. 28, 1983, 58-11248
Int. Cl.³ B41L 23/00
U.S. Cl. 427—144 9 Claims

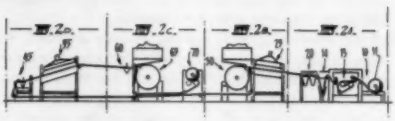
1. A method of reducing linting or smudging on resin based relief printing plates comprising treating the printing plate with a surface treating agent comprised of an anionic, cationic or ampholytic fluorocarbon having a perfluoroalkyl group with 4 to 14 carbon atoms.

4,478,886

METHOD OF TREATING AND COATING A FABRIC WEB

Eric Duggan, 8 Oakdale Grove, Laverton, Victoria, Australia (3028)

Filed Apr. 28, 1982, Ser. No. 372,527
Claims priority, application Australia, Apr. 29, 1981, PE8646
Int. Cl.³ B05D 3/02, 5/06
U.S. Cl. 427—210 8 Claims



5. A method of treating and coating a fabric web comprising supplying a web having an upper, first surface and a lower, second surface from a storage means located at or near a first end location in a first direction toward a second end location,

passing the web through a first treatment station where a first material is applied to at least one surface thereof,

passing the web through a second station located beyond said first station in said first direction where a first coating of a liquid material is applied to the upper first surface thereof,

passing the web through a heating, third station located beyond said second station in said first direction where the first liquid coating material is dried,

passing the web through a guide means located at said second end location whereby the second, downwardly directed surface becomes the upwardly directed surface with the web moving in a second direction of movement opposite to said first direction,

passing the web in said second direction through a fourth station located intermediate said ends where a second coating of a liquid material is applied to the second, now upwardly directed surface,

passing the web in said second direction through a heating, fifth station where the second liquid coating material is dried,

passing the web in said second direction through a sixth station where said second web surface is treated with a protective surface after the second liquid coating has been at least partially dried,

passing the web in said second direction through a heating, seventh station where heat is applied to said first web surface, and

passing the web to take up storage reel located intermediate said ends after drying is complete,

and winding the web with said second web surface being on the outside of a roll on said reel.

4,478,887

REINFORCED SUPPORT SHEET AND METHOD FOR MAKING SAME

Horst Sommer, Musberg, and Hansgeorg Gronle, Filderstadt, both of Fed. Rep. of Germany, assignors to Elring Dichtungswerke GmbH, Feilbach, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,812
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136015
Int. Cl.³ C09J 5/02
U.S. Cl. 427—211 6 Claims

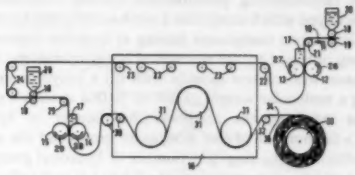
1. A method of making a reinforced support sheet for use in forming gaskets and heat resistant plates, the support sheet being of the type including a sheet-like, smooth support material and a layer of vulcanizable soft material covering each of the sides of said sheet-like support material, comprising the steps of:

preparing a composition of an elastomeric soft material

comprised by weight of at least 80% of an asbestos-free, mineral base material, up to 14% of an asbestos-free fiber material, and about 6% of an elastomeric binder material;

feeding said sheet-like support material successively between two separate pairs of calender rollers, the two rollers of each pair of which are driven at different circumferential speeds;

applying a layer of said soft elastomeric material as a flowable bulk material successively onto both sides of said



support material by means of said calender rollers, said soft elastomeric material being applied onto one side of said support material immediately before it enters the nip between one pair of calender rollers and said soft elastomeric material being applied to the other side of said support material immediately before it enters the nip between the other pair of calender rollers; and

drying and vulcanizing said layers of soft elastomeric material in an oven.

4,478,888

PROCESS FOR PRODUCING REFRACTORY POWDER

Mary L. Benjamin, Athens; Robert J. Dobbs, Monroeton, and Mary E. Shaffer, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 365,685, Apr. 5, 1982, Pat. No. 4,397,889. This application Aug. 4, 1983, Ser. No. 520,095

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—220 **1 Claim**

1. A process for producing a powder mixture of metal carbide particles, metal binder particles and wax suitable for making a cemented metal carbide comprising forming a mixture of metal carbide particles and wax at a temperature above the melting point of said wax, said metal carbide particles and wax being sufficiently mixed to form a blended mixture of wax and metal carbide particles, said wax including less than about 2 percent by weight of a wetting agent for reducing the surface tension of said wax in water, said said wetting agent having a melting point greater than room temperature, milling said blended mixture including metal binder particles with a liquid milling medium comprising water to substantially uniformly disperse said metal binder particles and to produce a slurry, said metal binder particles being added prior to or during milling, said wax being substantially insoluble in said liquid milling medium and produce a powder comprising particles of metal carbide, metal binder and wax.

4,478,889

PROCESS FOR PREPARATION OF COATED PLASTIC CONTAINER

Yoshitsugu Maruhashi, Yokohama; Isao Tanikawa, Ayase, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

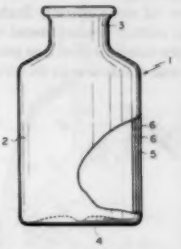
Filed Nov. 3, 1982, Ser. No. 438,758

Claims priority, application Japan, Nov. 5, 1981, 56-176368

Int. Cl.³ B05D *7/22*

U.S. Cl. 427—230 **13 Claims**

1. A process for the preparation of a coated plastic container, which comprises coating an aqueous latex or organic solvent solution of a vinylidene chloride copolymer on at least one surface of a plastic container formed by hot molding of a thermoplastic resin, drying the coating and heat-treating the coating simultaneously with or subsequently to the drying step to crystallize the coating until the degree of crystallization is at



least 0.5 as measured according to the infrared absorption spectrum method.

4,478,890

LOW TEMPERATURE DEPOSITION OF NICKEL FILMS

Alan D. Berry, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 12, 1983, Ser. No. 531,387

Int. Cl.³ C23C *11/00, 13/00*; B05D *1/18*

U.S. Cl. 427—252 **21 Claims**

1. A low temperature process for the deposition of nickel upon a substrate, the steps of which comprise:

forming a nickel-olefin-trifluorophosphine complex;

collecting said complex as a condensate upon said substrate;

decomposing said complex upon said substrate to form an olefin, a coating of nickel metal, and $Ni(PF_3)_4$.

4,478,891

METHOD OF REDUCING THE EMISSION OF FORMALDEHYDE FROM PARTICLE BOARD BOUND WITH CARBAMIDE RESIN

Anders W. Westling, Upplands Väsby, Sweden, assignor to AB Statens Skogsindustrier, Stockholm, Sweden

Continuation of Ser. No. 192,602, Sep. 30, 1982, abandoned. This application Jul. 19, 1983, Ser. No. 515,185

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—317 **14 Claims**

1. A method of reducing the emission of formaldehyde from particle board bound with carbamide resin, wherein subsequent to being pressed the boards are cooled to a temperature of 40°–70° C., then the boards are coated with a concentrated aqueous solution containing (a) at least one ammonium compound selected from the group consisting of ammonium carbonate and ammonium hydrogen carbonate, and (b) urea, and then immediately after coating the boards are stacked for at least one day for conditioning, the weight ratio of urea to said ammonium carbonate being from 1:2 to 1:10, the amount of the ammonia compound being at least 10 g per square meter of board and the amount of urea being at least 5 g per square meter of board.

4,478,892

METHOD OF AND APPARATUS FOR HOT DIP COATING OF STEEL STRIP

Paul E. Amberson, Valparaiso, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1983, Ser. No. 475,895

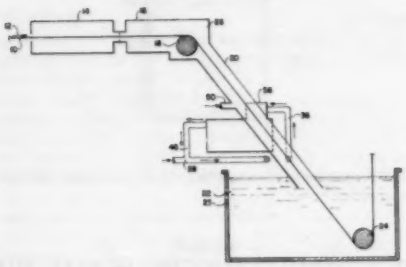
Int. Cl.³ B05D *3/02*; B05C *3/12*

U.S. Cl. 427—320 **17 Claims**

1. In a method of hot dip coating a running length of a steel strip with a metal coating, wherein the steel strip is moved from a heating furnace into a molten bath of the coating metal

through a protective atmosphere contained in an enclosed hood having a snout terminating in an open outlet positioned below the surface of the molten bath of coating metal, the improvement comprising,

directing a flow of nonoxidizing flushing gas across the surface of the molten coating metal within the snout on both sides of the strip in a direction generally parallel to its face surfaces and transverse to its direction of movement



by admitting the gas into the hood snout through an inlet located at one side of the snout in the vicinity of the surface of the molten coating metal, and

simultaneously withdrawing flushing gas from the hood through an oxide removal outlet located substantially opposite the flushing gas inlet and at a location in the vicinity of the surface of the molten metal bath to remove coating metal oxide vapors from the hood.

4,478,893

POLYISOCYANATE ADDITION PRODUCTS USEFUL AS MOLD RELEASE AGENTS AND A PROCESS FOR THEIR PRODUCTION

Manfred Schönfelder, Leverkusen; Peter Haas, Haan; Geza Avar, and Helmut Steinberger, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 445,323, Nov. 29, 1982,. This application Oct. 6, 1983, Ser. No. 539,508

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149619

Int. Cl.³ B05D 3/02

U.S. Cl. 427—387 6 Claims

1. A process for the production of polyurethane-based molded articles covered with a lacquer in which

(1) internal walls of a mold are lacquered with an in-mold coating lacquer containing a mold release agent which is a reaction product of:

(a) a first reaction product of a polysiloxane having isocyanate reactive end groups and an excess of organic polyisocyanate which first reaction product contains at least two isocyanate end groups and

(b) a compound selected from the group consisting of aliphatic alcohols, primary aliphatic amines, secondary aliphatic amines and mixtures thereof which have a molecular weight of from 75 to 5000 and which is monofunctional in the isocyanate addition reaction and contains at least one tertiary amino group and/or oxyalkylene unit before a reaction mixture for producing the polyurethane is introduced into the mold,

(2) filling the mold with polyurethane-forming mixture after the lacquer has partially dried, and

(3) allowing the contents of the mold to solidify.

4,478,894

ONE-PACK TYPE THERMOSETTING POLYURETHANE COATING COMPOSITION

Michio Tanaka, Shizuoka; Yoshio Kamatani, Osaka, and Koji Nasu, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

Filed Nov. 29, 1982, Ser. No. 445,099

Claims priority, application Japan, Nov. 30, 1981, 56-193323

Int. Cl.³ B05D 3/02; C08G 18/10, 18/28

U.S. Cl. 427—388.2 9 Claims

1. A thermosetting polyurethane coating composition of one-pack type which comprises a product obtained by reacting (i) an isocyanate component having at least one oxidiazinetrione ring obtained by the reaction of bis(isocyanatomethyl)cyclohexane with carbon dioxide with (ii) a polyol component having a molecular weight of 400 to 50,000 at such a proportion as satisfying the relations: the number of hydroxyl group > the number of free isocyanate group and the number of oxadiazinetrione ring/(the number of hydroxyl group − the number of free isocyanate group) = 0.6 to 1.6; said polyol component (ii) being a polyester polyol, a polyurethane polyol, an acrylic polyol or an epoxy polyol.

6. A coating process which comprises coating on a surface to be coated a composition comprising a product obtained by reacting (i) an isocyanate component having at least one oxadiazinetrione ring obtained by the reaction of bis-(isocyanatomethyl)cyclohexane with carbon dioxide with (ii) a polyol component having a molecular weight of 400 to 50,000 at such a proportion as satisfying the relations: the number of hydroxyl group > the number of free isocyanate group and the number of oxadiazinetrione ring/(the number of hydroxyl group − the number of free isocyanate group) = 0.6 to 1.6 and baking the coated composition at about 100° to 150° C. for about 1 to 30 minutes; said polyol component (ii) being a polyester polyol, a polyurethane polyol, an acrylic polyol or an epoxy polyol.

4,478,895

METHOD OF MANUFACTURE OF SILICONE ELASTOMER COATED CLOTH

Ryuzo Makami, and Akito Nakamura, both of Ichihara, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1984, Ser. No. 573,539

Int. Cl.³ B05D 3/02

U.S. Cl. 427—407.3 12 Claims

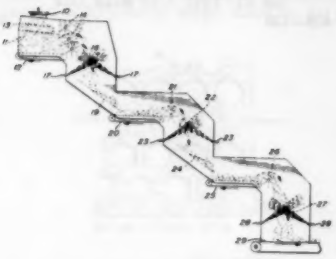
1. A method of manufacturing a silicone elastomer-coated cloth having a layer of silicone resin over silicone elastomer consisting essentially of coating a cloth with silicone elastomer composition of a type selected from the group consisting of an addition-reaction-curing type using a platinum catalyst and an organic peroxide-curing type, after which a silicone resin composition of the addition-reaction-curing type using a platinum catalyst and having a molar ratio of organic groups to silicon atoms of 0.8 to 1.8 is coated over the surface of the silicone elastomer composition and then the said silicone elastomer composition and the said silicone resin composition are simultaneously heat cured.

4,478,896

APPARATUS FOR BLENDING WOOD STRANDS WITH A LIQUID RESIN

Derek Barnes, Vancouver; Jan A. H. Dessens, Hudson Bay, and George N. Rosenberg, Vancouver, all of Canada, assignors to MacMillan, Bloedel Limited, Vancouver, Canada

Filed Nov. 15, 1982, Ser. No. 441,925
Int. Cl.³ B05D *1/02*; B05B *17/00*
U.S. Cl. 427—421 8 Claims



5. A process for continuously blending wood strands with a liquid resin, comprising the steps of:

advancing a substantially constant flow of wood strands to form a first falling curtain of separated wood strands, the first curtain having a predetermined substantially constant width;

spraying liquid resin droplets on each side of the first curtain, the spraying extending from both sides of the width of the first curtain, but not substantially beyond;

collecting the first sprayed wood strands and advancing the first sprayed wood strands to form a second falling curtain of separated wood strands, the second curtain having a predetermined substantially constant width; and

spraying liquid resin droplets on each side of the second curtain, the spraying extending from both sides of the width of the second curtain, but not substantially beyond.

4,478,897

COMPOUND MOLDING

Tohru Akashi, Nagoya, and Yutaka Watanabe, Toyoake, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 300,736, Sep. 10, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 485,829
Claims priority, application Japan, Sep. 12, 1980, 55-130609
Int. Cl.³ B32B *15/08*; B60R *13/02*
U.S. Cl. 428—31 7 Claims

1. A compound molding comprising:

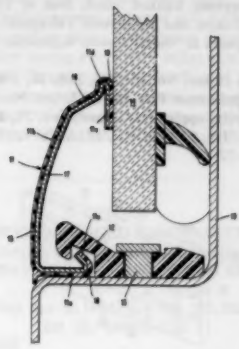
a front surface layer portion made of a hard resin selected from the group consisting of cellulose acetate butyrate, polycarbonate, and polyvinylchloride;

a central base metal portion comprising material selected from the group consisting of cold rolled stainless steel and cold rolled carbon steel;

a resinous layer portion intermediate said front surface layer portion and said central base metal portion, said intermediate layer comprising resin selected from the group consisting of acrylonitrile butadiene styrene and acrylate stryene acrylonitrile;

at least one end of said central base metal portion having a section extending beyond said front surface layer portion and said resinous layer portion; and

a protective portion made of a soft vinyl chloride resin on each said extended section of said central base metal portion of said molding and forming a continuous surface with said front surface layer portion and interfacing with



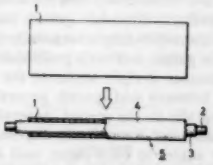
said front surface layer portion and said resinous layer portion.

4,478,898

LAMINATED POROUS POLYTETRAFLUOROETHYLENE TUBE AND ITS PROCESS OF MANUFACTURE

Hiroshi Kato, Tokorozawa, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 384,875
Int. Cl.³ F16L *9/16*; B32B *27/32*; B29D *7/24*, *27/00*
U.S. Cl. 428—36 9 Claims



1. The product produced by the process of:

(a) extruding a first sheet of unsintered PTFE containing lubricant by conventional techniques;

(b) wrapping said first sheet about a mandrel such that the extrusion or machine direction of said first sheet is oriented longitudinally to said mandrel, and the longitudinal edges of said first sheet overlap somewhat along the length of said mandrel;

(c) wrapping a second sheet of unsintered PTFE over said first sheet such that the machine direction of said second sheet is oriented circumferentially about said mandrel, thereby providing a reinforcing material for said first sheet;

(d) applying external pressure to said wrapped mandrel such as by rolling in order to provide a uniform wall thickness of the tube formed by said wrappings;

(e) removing said tube from said mandrel;

(f) heating said tube at a temperature below about 327° C. to remove said lubricant;

(g) stretching said tube in the direction of its longitudinal axis to a stretch ratio of about 1.4 to about 15:1; and

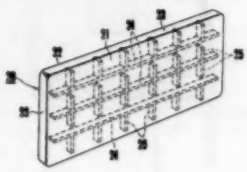
(h) heating said tube to a temperature higher than about 327° C. while holding it in its stretched state.

4,478,899

SEAT CORE MEMBERS OR PARTITION PLATES FOR VEHICLES FORMED FROM SYNTHETIC RESIN

Yoshishige Mayumi; Kenzoh Satoh, both of Yokohama; Kenji Hasegawa, Tokyo, and Mitsuyoshi Takahashi, Kitakata, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 236,495, Feb. 20, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,223
Claims priority, application Japan, Feb. 27, 1980, 55-23746
Int. Cl.³ B32B 3/12; A47C 7/02
U.S. Cl. 428—72 6 Claims



1. A structural member for automobile seat elements to which a flexible covering is to be applied comprising a hollow, seamless, blow-molded, synthetic resin core member having a pair of spaced, generally parallel panels extending over substantially all of said member and peripheral connecting wall joining them around the member, said panels and peripheral connecting wall being of uniform thickness and integrally connected, said spaced, generally parallel panels defining uninterrupted planar exterior surfaces throughout the length and breadth of the core member and said peripheral connecting wall defining an outer peripheral edge surface around the core member substantially perpendicular to the planar surfaces of the panels and reinforcing, stiffening and connecting the members interiorly of the hollow core member positioned both longitudinally and transversely thereof comprising longitudinally and transversely-disposed, spaced, parallel ribs of uniform thickness corresponding substantially in thickness to the thickness of the panels and wall positioned interiorly of the hollow core member at right angles to the spaced, generally parallel panels between said spaced, generally parallel panels and joined integrally to the spaced, generally parallel panels, said longitudinally and transversely-disposed ribs being positioned at right angles to each other, said longitudinally and transversely-extending ribs terminating short of the peripheral connecting wall so that the reinforcement of the spaced, generally parallel panels at their edges is constituted solely by the peripheral connecting wall and wherein the transverse ribs are integral at one end only with a longitudinal rib and at their other ends spaced from the adjacent longitudinal rib and from the peripheral connecting wall.

4,478,900

WOVEN FABRIC CONTAINING PARTIALLY FIBRILLATED TEXTILE YARN

Juergen Nebe, and Bernhard H. Ladeur, both of Gronau-EPE, Fed. Rep. of Germany, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 2, 1982, Ser. No. 413,998
Int. Cl.³ B32B 3/02
U.S. Cl. 428—92 8 Claims

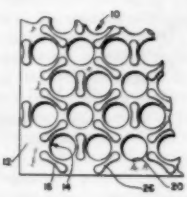
1. Woven fabric useful as primary carpet backing suitable for fine gauge tufting comprising (A) in the warp direction a tape formed from a macromolecularly orientable thermoplastic polymer said tape having a linear density of about 200 to about 600 dtex with about 60 percent to about 80 percent of its surface area longitudinally fibrillated and (B) a fill yarn selected from the group consisting of the tape of part A above, a profiled tape having at least about 1.8 profiles per millimeter with a linear density of 500 to 1100 dtex, or an unfibrilliated tape haivng linear density of about 300 to about 1500 dtex.

4,478,901

FLOOR MAT CONSTRUCTION

David R. Dickens, Lincoln; Waldo Smith, Warwick, and Herbert Malin, Barrington, all of R.I., assignors to Teknor Apex Company, Pawtucket, R.I.

Filed Nov. 29, 1982, Ser. No. 445,544
Int. Cl.³ E01C 5/18; B32B 3/24
U.S. Cl. 428—120 6 Claims



1. A floor mat construction comprising:

(a) a base made of a rubberized material and having a plurality of apertures therethrough, the upper portions of said aperture being of multisided geometric configuration, said apertures being disposed in adjacent offset rows wherein each of the sides of the upper portions of said apertures, other than those in the peripheral rows on said base, define common walls with adjacent sides of the upper portions of adjacent apertures so that said apertures cooperate to define a honeycomb-like configuration in said base; and

(b) a plurality of resiliently flexible spaced feet extending integrally downwardly from the underside of said base to maintain said base in slightly upwardly spaced relation to a supporting surface when positioned thereon, said feet having substantially flat bottom surfaces and being of elongated barbell-like sectional configuration wherein the transverse sectional dimensions of said feet are greater in the opposite end portions thereof than in the central portions thereof.

5. A floot mat construction comprising a base made of a rubberized material and having a plurality of apertures therethrough, the upper portions of said apertures being of multisided geometric configuration, the lower portions of said apertures being of downwardly and inwardly tapered substantially circular configuration, said apertures being disposed in adjacent offset rows wherein each of the sides of the upper portions of said apertures, other than those in the peripheral rows on said base, define common walls with adjacent sides of the upper portions of adjacent apertures so that the upper portions of said apertures cooperates to define a honeycomb-like configuration in the upper portion of said base and the inwardly tapered lower portions of said apertures provide increased strength in said base and increased supporting area on the underside of said base, and a plurality of spaced feet of elongated sectional configuration extending integrally downwardly from the underside of said base adjacent the lower portions of said apertures.

4,478,902

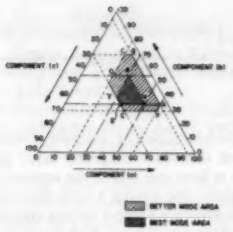
SCREEN FOR PROJECTION TELEVISION

Susumu Tsuzuku, Tokyo; Yasuo Hira, Fujisawa; Masao Gotoh, Yokosuka; Hitoshi Yokono, Katsuta, and Yoshihisa Hosoe, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,348
Claims priority, application Japan, Sep. 4, 1980, 55-121770
Int. Cl.³ G03B 21/56; B32B 5/14, 5/20, 7/12
U.S. Cl. 428—174 16 Claims

1. In a screen for projection television set comprising a thick

plate-like support slightly curved and a reflective film adhered to the concave side of said support, the improvement wherein said support is made of a formed article having an inner portion and outer layer at the sides of the inner portion, the outer layers of said support having a high density so as to give sufficient surface hardness to the reflective film and the inner portion of said support having a low density so as to make the density of said support as a whole very low, wherein the support is made from a foaming reaction mixture comprising a polyisocyanate, a polyol, a low-boiling solvent as a blowing agent and one or more additives, the amount of the low-boiling solvent being 5 to 50 parts by weight based on 100 parts by



weight of the polyol, and wherein the foaming reaction mixture contains as the polyol

(a) an alkylene oxide adduct of 4,4'-diaminodiphenylmethane having an OH value of 280 to 600 KOH mg/g,

(b) an aliphatic polyol having an OH value of 450–800 KOH mg/g and 3 or 4 OH groups in the molecule, and

(c) a polyol having an OH value of 30 to 100 KOH mg/g and 2 or 3 OH groups in the molecule,

the proportions of these components (a) to (c) being in the closed area of A-B-C-D-E-F-A in a triangular diagram taking each component (a), (b) or (c) at respective vertices of a triangle, the points A to F having the following compositions in percents by weight:

Points	Component (a)	Component (b)	Component (c)
A	60	35	5
B	25	70	5
C	20	70	10
D	20	50	30
E	40	30	30
F	60	30	10

12. A screen according to claim 1, wherein the reflective film has on its surface adjacent to the support a layer of primer or adhesive to increase the bonding between the reflective film and the support.

4,478,903

COMPOSITE PLASTICS SHEET HAVING CONDUCTIVE SURFACE

Kozi Kishida, Yokohama; Noboru Iwato, Zama, and Yuji Ozeki, Yamato, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,538
Claims priority, application Japan, Jun. 11, 1981, 56-89991
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—216 **15 Claims**

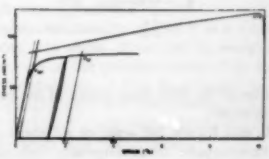
1. A composite plastics sheet having a conductive surface, comprising a substrate sheet made of a resin selected from the group consisting of a polystyrene base resin and an ABS base resin, and a conductive surface layer made of a resin selected from the group consisting of a polystyrene base resin and an ABS base resin, said conductive surface layer containing 5 to 50%, by weight, of carbon black and having a specific surface resistance of not more than 10^{10} ohms, said conductive surface layer being laminated on one or both surfaces of said substrate sheet by co-extrusion, said polystyrene base resin being selected from the group consisting of high impact strength polystyrenes, a blended polystyrene base resin, and mixtures thereof, said polystyrene base resin and said ABS base resin for the conductive surface layer after being compounded with carbon black each having a melt flow index of not less than 0.1 g/10 min. at 200° C. and under the loading of 5 kg, the total thickness of said composite plastics sheet being from 0.1 to 3.0 mm, the thickness of said conductive surface layer ranging from 2% and 70% of said total thickness of the composition plastics sheet.

4,478,904

METAL FIBER REINFORCED BIOGLASS COMPOSITES

Paul L. R. Ducheyne, Blanden, Belgium, and Larry L. Hench, Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Apr. 8, 1981, Ser. No. 252,220
Int. Cl.³ D04H *1/58*
U.S. Cl. 428—288 **13 Claims**



1. A metal fiber reinforced bioglass final composite which comprises a compacted, shaped, coherent skeletal mass of metal fibers wholly embedded in a matrix of bioglass, said skeletal mass providing pores throughout and said skeletal mass being sintered so that said pores are filled with the bioglass, the mass occupying a volume of the composite which is in the order of 10–80%, the balance being substantially bioglass.

4,478,905

SPANDREL PRODUCT WITH SILICATE COATING

James E. Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 388,330, Jun. 14, 1982, which is a continuation-in-part of Ser. No. 286,993, Jul. 27, 1981, Pat. No. 4,334,941, which is a continuation-in-part of Ser. No. 142,492, Apr. 21, 1980, Pat. No. 4,288,252, which is a continuation of Ser. No. 973,479, Dec. 26, 1978, abandoned. This application Nov. 22, 1982, Ser. No. 443,502
Int. Cl.³ B13B *13/04*; C09J *1/02*; B32B *17/06*
U.S. Cl. 428—324 **16 Claims**

1. An article of manufacture comprising:

a. a rigid substrate; and

b. disposed on a major surface of said substrate an opaque coating composition comprising:

1. an alkali silicate; and

2. an aluminum trimetaphosphate hardener predominantly in the B-form.

9. An article of manufacture comprising:

a. a glass substrate; and

b. disposed on a major surface of said substrate an opaque coating composition comprising:

1. an alkali silicate; and

2. an aluminum trimetaphosphate hardener predominantly in the B-form.

4,478,906
IMPREGNATED INSULATING TAPE FOR FABRICATING AN INSULATING SLEEVE FOR ELECTRIC CONDUCTORS

Walter Ihlein, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

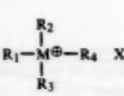
Filed Apr. 28, 1983, Ser. No. 489,388

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218287

Int. Cl.³ B32B *5/16, 27/38*

U.S. Cl. 428—324 **13 Claims**

1. An insulating tape suitable for manufacturing an insulating sleeve for electric conductors which tape is impregnated with a thermo-setting epoxy resin/acid anhydride hardener mixture, which comprises at least one layer of particles of an inorganic, breakdown-proof planar material selected from the group consisting of mica flakes and thin mica films, said layer being bonded to a flexible substrate and said material particles being bonded to each other with an epoxy resin binder containing as an accelerator for promoting the hardening reaction of the resin used for impregnation, a quaternary onium salt having the following structural formula:



wherein:

M is an atom of the fifth main group of the periodic system of the elements;

R_1, R_2, R_3 and R_4 are the same or different aliphatic, aromatic, heterocyclic or arylaliphatic radicals, or two or three of said radicals form with M at least one heterocyclic ring,

at least one of the radicals R_1, R_2, R_3, R_4 or the heterocyclic ring formed with the central atom has at least one moiety which can react with the bonding agent impregnating resin mixture, said moiety being selected from an epoxy, a hydroxy, a mercapto, a carboxyl, an amino or an imino group;

X is an anion selected from the group consisting of Cl, ClO_4, an aliphatic or aromatic organic acid radical, and a complex inorganic anion; and

said mixture of binder and accelerator form a system which is self-hardening at the setting temperature of the thermo-setting impregnating resin.

4,478,907
AQUEOUS COPOLYESTER DISPERSIONS SUITED FOR THE SUBBING OF POLYESTER FILM

Lucien J. Van Gossum, Kontich; August M. Mariën, Oevel; Walter F. De Winter, 's-Gravenwezel, and Etienne A. Van Thillo, Essen, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Oct. 26, 1982, Ser. No. 436,672

Claims priority, application United Kingdom, Nov. 2, 1981, 8132936

Int. Cl.³ B32B *5/16, 27/06;* **G03C** *1/78*

U.S. Cl. 428—327 **11 Claims**

1. A subbed polyester film comprising a polyester film base and directly affixed thereto a dried subbing layer of a copolyester applied from an aqueous dispersion and derived from ethylene glycol and an acid mixture consisting essentially of 20–60 mole % of isophthalic acid, 6–10 mole % of sulphoisophthalic acid whose sulpho group is in salt form, 0.05 to 1 mole % of an aromatic polycarboxylic acid compound having at least three carboxylic acid groups which is not capable of forming intramolecularly an anhydride and includes at least two carboxylated aromatic nuclei, and the balance of terephthalic acid, said copolyester having a glass transition temperature of at least 50° C. and an intrinsic viscosity of from 0.15 to 0.45 dl/g when measured at 25° C. in a mixture of phenol/o-dichlorobenzene in a ratio of 60/40 by volume.

4,478,908
MAGNETIC RECORDING MEDIUM

Chiaki Mizuno, and Yasuo Tamai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1982, Ser. No. 437,048

Claims priority, application Japan, Oct. 27, 1981, 56-171894

Int. Cl.³ B32B *5/16;* **G11B** *5/78*

U.S. Cl. 428—327 **8 Claims**

1. A magnetic recording medium comprising a support having coated thereon a magnetic layer and a leader tape connected to at least one end of the support and the magnetic layer, said leader tape having a light transmittance of 40% or more and comprising a support having coated thereon a cleaning layer containing an organic high molecular weight powder and a binder, wherein an antistatic layer comprising a cationic, anionic or non-ionic-type antistatic agent is provided on at least one surface of the leader tape and wherein the amount of said antistatic agent in said antistatic layer is in the range of from about 5 mg/m² to about 300 mg/m².

4,478,909
ANTI-FOGGING COATING FILM

Takashi Taniguchi, Shiga, and Jiro Mibae, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,168

Claims priority, application Japan, Oct. 24, 1980, 55-148284; Oct. 27, 1980, 55-149377

Int. Cl.³ B32B *5/16, 9/04, 13/12*

U.S. Cl. 428—331 **12 Claims**

1. An anti-fogging coating film comprising a cured film having a surface layer and an underlying layer, each of said layers being derived from components A, B and C and coated on a substrate, the silicon content thereof being 0.7–2.0/1.0 in terms of carbon/silicon weight ratio, and the carbon/silicon weight ratio of the surface layer of the film being larger than that of the underlying layer and being not less than 1.7/1.0 and wherein each layer comprises:

A: 100 parts by weight of polyvinyl alcohol,

B: 60–300 parts by weight of finely divided silica having an average particle size of about 5–200 nm, and

C: 0.5–30 parts by weight of at least one compound selected from the group consisting of organic silicon compounds having a general formula:

$$R^1R_a^2Si(OR^3)_{3-a}$$

wherein R^1 is an organic group having 1 to 10 carbon atoms, R^2 is a hydrocarbon group having 1 to 6 carbon atoms, R^3 is an alkyl, alkoxyalkyl or acyl group and a=0 or 1, and the hydrolysates thereof.

4. An article having on the surface thereof, an anti-fogging film comprising a cured film having a surface layer and an underlying layer, each of said layers being derived from components A, B and C and coated on a substrate, the silicon content thereof being 0.7–2.0/1.0 in terms of carbon/silicon weight ratio and the carbon/silicon weight ratio of the surface layer of the film being larger than that of the underlying layer and being not less than 1.7/1.0 and wherein each layer comprises

A: 100 parts by weight of polyvinyl alcohol,

B: 60–300 parts by weight of finely divided silica having an average particle size of about 5–200 nm, and

C: 0.5–30 parts by weight of at least one compound selected from the group consisting of organic silicon compounds having a general formula:

$$R^1R^2Si(OR^2)_{3-a}$$

wherein R^1 is an organic group having 1 to 10 carbon atoms, R^2 is a hydrogen group having 1 to 6 carbon atoms, R^3 is an alkyl, alkoxyalkyl or acyl group and a=0 or 1, and the hydrolysates thereof.

4,478,910

INK JET RECORDING PAPER

Hiroyo Oshima; Yutaka Kojima; Yukio Kobayashi; Takashi Omori, and Koichi Nagai, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,585

Claims priority, application Japan, Apr. 7, 1983, 58-59968

Int. Cl.³ B41M *5/00*

U.S. Cl. 428—331 **5 Claims**

1. Ink jet recording paper comprising on a base sheet a coating layer, said base sheet having a Stöckigt sizing degree of less than 4 sec. (based on a basis-weight of 60 g/m^2), and said coating layer comprising a water-soluble polymeric binder and fine silica particles having a specific surface area of more than 200 m^2/g as measured by the BET method and a uniformity number n of the Rosin-Rammler distribution of greater than 1.10.

4,478,911

STONE TREATMENT

Clifford A. Price, Long Marston, Nr Tring, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 002,592, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 818,753, Jul. 25, 1977, abandoned. This application Oct. 20, 1980, Ser. No. 198,582

Claims priority, application United Kingdom, Jul. 28, 1976, 31448/76

Int. Cl.³ B32B *9/04*; C09K *3/00*

U.S. Cl. 428—332 **7 Claims**

1. In a process of treatment of a porous inorganic material in which the porous inorganic material is impregnated with a single lead phase liquid mixture comprising alkoxymethyl or alkoxyethylsilane, water, an organic solvent and a silanol polymerization catalyst, and in which the mixture is permitted to penetrate into the said porous material for an initial period of at least two hours at ambient temperature, after which gelation rapidly takes place, the improvement comprising: impregnating said porous inorganic material with said single phase liquid mixture containing a lead soap or a lead carboxylate salt as the silanol polymerization catalyst.

4,478,912

BLENDED PRESSURE-SENSITIVE ASPHALTIC BASED ADHESIVES

William E. Uffner, Newark; Robert N. White, Etna, both of Ohio, and Edward R. Harrington, Naperville, Ill., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 12, 1982, Ser. No. 407,394

Int. Cl.³ B32B *11/04, 25/08*; C09J *7/02*

U.S. Cl. 428—349 **3 Claims**

1. In an article comprising a laminate of an asphaltic based composition coated on a reinforcement and including a pressure sensitive asphaltic based adhesive coated on one side of said laminate, the improvement wherein said adhesive is a hot melt blended composition consisting essentially of paving grade asphalt, effective tacky amounts of a depolymerized virgin rubber having a molecular weight of about 10,000 to about 110,000, effective viscosity depressing amounts of a terpene resin and effective cold flow resisting amounts of a non-depolymerized styrene-butadiene copolymer.

4,478,913

BLENDED POLYESTERIMIDE-POLYESTERAMIDEIMIDE ELECTRICAL COATING COMPOSITIONS

Denis R. Pauzé, East Glenville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 194,975, Oct. 8, 1980, abandoned. This application May 24, 1982, Ser. No. 381,127

Int. Cl.³ C08L *79/08, 77/00*

U.S. Cl. 428—383 **11 Claims**

1. A soluble coating composition suitable for the insulation of electrical conductors comprising a blend of:

A. a polysterimide obtained by heating the following ingredients to a temperature of from about 190° C. to about 250° C., said ingredients comprising:

(a) an aromatic diamine;

(b) an aromatic carboxylic anhydride containing at least one additional carboxylic group;

(c) terephthalic acid or a reactive derivative thereof;

(d) a polyhydric alcohol having at least three hydroxyl groups;

(e) an alkylene glycol; and

B. the polyesteramideimide of this B in a concentration of from about 1 to about 20 percent by weight of the total solids content of the polyesterimide of A above and the polyesteramideimide of this B obtained by heating the following ingredients to a temperature of from about 190° C. to about 250° C., said ingredients comprising

(a) a tricarboxylic acid compound;

(b) a polyamine; and

(c) an aliphatic dicarboxylic acid,

(d) and thereafter adding an alkylene clycol to the reaction product of B(a), (b) and (c) when the special product has a carboxyl content is from about 2.5 to about 2.7.

4,478,914

PROCESS FOR APPLYING MULTIPLE LAYERS OF A PROTEIN AND A LIGAND EXTENDER TO A SURFACE AND TO THE MULTIPLE-LAYER SYSTEM

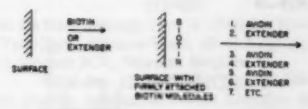
Roger W. Giese, 56 Oakland Ave., Quincy, Mass. 02170

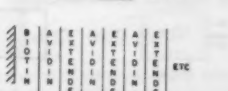
Continuation of Ser. No. 272,297, Jun. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 114,898, Jan. 24, 1980, Pat. No. 4,282,287. This application Sep. 14, 1983, Ser. No. 532,036

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.³ B32B *5/16, 9/00*

U.S. Cl. 428—407 **29 Claims**





1. A process of modifying the surface properties of a material, which process comprises: applying alternate, molecular, successive layers of first and second materials to the surface to be modified, the first material comprising a ligand binding proteinaceous material and the second material comprising a reactive ligand extender material, one of the materials reacted to the surface and, thereafter, at least one additional layer of

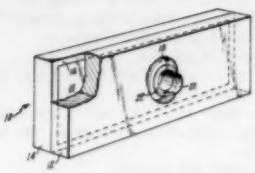
the first and second materials alternately secured and noncovalently ligand reacted to the underlying layer of the other material, to provide a modified surface, with the first or second material as the top surface layer.

4,478,915

CORROSION RESISTANT SHIM FOR ELECTRICALLY JOINING INCOMPATIBLE MATERIALS

Eliasz Poss, Guilford, and Marvin Felsen, Fairfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 7, 1983, Ser. No. 549,388
Int. Cl.³ F16B *11/00*
U.S. Cl. 428—607 **5 Claims**



1. A corrosion-resistant, electrically-conductive shim for interposition between a material having a first galvanic potential and a material having a second galvanic potential, the shim comprising:

a first side made of a material having a third galvanic potential that is compatible with the first galvanic potential;

a second side, made of a material having a fourth galvanic potential that is compatible with the second galvanic potential, the second side juxtaposed in peripheral correspondence with the first side and in contact with the first side in a central contact area therebetween; and

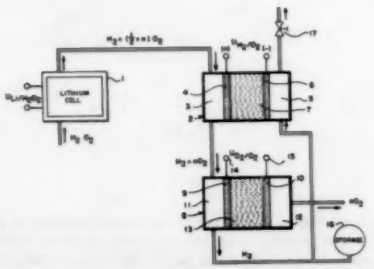
non-conductive sealant, disposed about the periphery of the two sides, for excluding moisture from the contact area between the first side and the second side.

4,478,916

METHOD AND APPARATUS FOR OPERATING AQUEOUS GALVANIC HIGH ENERGY CELLS

Alfgiist Winsel, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,612
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913908
Int. Cl.³ H01M *16/00*
U.S. Cl. 429—9 **9 Claims**



1. A method of operating an aqueous galvanic high energy cell in conjunction with a fuel cell, the high energy cell having electrodes of lithium, aluminum, or an Li/Al alloy, and having H_2O_2 as cathode depolarizer, said method comprising

supplying the H_2/O_2 gas mixture developed in the high energy cell to the positive electrode of the fuel cell, and from there to the negative electrode of the fuel cell, and

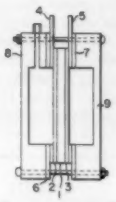
separating a quantity of excess oxygen from the gas mixture supplied to the negative electrode of the fuel cell which substantially equals the excess amount of oxygen above the stoichiometry of water, by means of an O_2/O_2 cell functioning as a cleaning cell.

4,478,917

FUEL CELL

Kazunori Fujita, Ibaraki; Kohki Tamura, Hitachi; Hidejiro Kawana, Hitachi; Kazuo Iwamoto, Hitachi, and Tatsuo Horiba, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,097
Claims priority, application Japan, Mar. 26, 1982, 57-49804
Int. Cl.³ H01M *8/10, 4/86*
U.S. Cl. 429—33 **18 Claims**



1. A fuel cell, which comprises an electrolyte ion exchange membrane, an oxidizer electrode, having water-repellent properties, comprising a mixture of noble metal particles of the periodic table, Group VIII and water repellent particles supported on one side of the ion exchange membrane, said mixture being formed on one side of the ion exchange membrane by dispersion plating, a hydrophilic fuel electrode containing noble metal particles of the periodic table, Group VIII and fixed to the opposite side of the membrane to the oxidizer electrode-formed side, an oxidizer supply means for supplying an oxidizer to the oxidizer electrode, and a methanol supply means for supplying methanol to the fuel electrode.

4,478,918

FUEL CELL STACK

Mitsushi Ueno; Tadanori Maoka, both of Yokohama; Kenji Murata, Tokyo, and Tamotsu Shirogami, Yamato, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 15, 1982, Ser. No. 449,998
Claims priority, application Japan, Dec. 25, 1981, 56-212385; Jun. 15, 1982, 57-102810
Int. Cl.³ H01M *2/08, 2/14, 8/04*
U.S. Cl. 429—38 **11 Claims**

1. A fuel cell stack having:

a plurality of stacked unit cells, each of said unit cells consisting of a pair of gas diffusion electrodes and a matrix containing an electrolyte solution interposed between said electrodes, and

an interconnector having a fuel gas passage on one surface and an oxidizing agent gas passage on the other surface interposed between each pair of adjacent ones os said unit cells,

wherein at least one of said interconnectors includes a one-piece-molded product and at least one cooling pipe coated with an insulating film embedded in said one-piece-molded product.

4,478,919

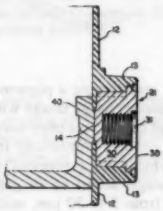
SIDE TERMINAL LEAD ALLOY PRODUCT AND PROCESS

Ralph G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Division of Ser. No. 319,919, Nov. 10, 1981, Pat. No. 4,424,854. This application Mar. 31, 1983, Ser. No. 480,936

Int. Cl.³ H01M *2/30*

U.S. Cl. 429—179 **6 Claims**



2. An alloy for integrally casting a unitary terminal of an electric storage battery, said alloy comprising:

(a) 10 wt-% brass;

(b) 3 wt-% antimony; and

(c) the remainder lead.

4,478,920

LITHIUM CELL HAVING A SOLID ELECTROLYTE CONSTITUTED BY A CONDUCTIVE VITREOUS COMPOUND

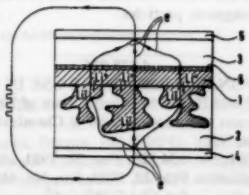
Jean-Paul Gabano, Poitiers, and Jean-Pierre Duchange, La Villedieu du Clain, both of France, assignors to GIPELEC, Levallois-Perret, France

Filed Apr. 13, 1983, Ser. No. 484,688

Claims priority, application France, Apr. 16, 1982, 82 06560

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—191 **7 Claims**



1. An electric cell having a lithium anode separated from a cathode by a solid electrolyte comprising a conductive vitreous compound having the formula aP_2S_5, bLi_2S, cLiX, where X represents chlorine, bromine, or iodine, and where a, b, and c are numbers chosen so that the ratio b/(a+b) lies between 0.61 and 0.70, and so that the ratio c/(a+b+c) is less than or equal to a limit corresponding to the solubility in vitreous phase of LiX in the compound aP_2S_5, bLi_2S, with the cathode comprising 20% to 80% by volume solid electrolyte together with an electron conductor, the improvement wherein the electrolyte further comprises a substance selected from the group consisting of the halogens and the chalcogens in order to produce an in situ chemical reaction at the lithium-electrolyte interface, thereby creating an ionically conductive bonding layer comprising a lithium halogenide or chalcogenide.

4,478,921

MANGANESE CARBONATE ADDITIVE FOR MANGANESE DIOXIDE-CONTAINING NONAQUEOUS CELLS

Richard A. Langan, Parma, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 28, 1983, Ser. No. 536,784

Int. Cl.³ H01M *6/16*

U.S. Cl. 429—194 **9 Claims**

1. In a nonaqueous cell comprising an active metal anode, a nonaqueous electrolyte solution comprising a solute dissolved in at least one organic solvent, and a solid cathode comprising manganese dioxide, a binder and a conductive agent; the improvement wherein the cathode contains a minor amount of manganese carbonate.

4,478,922

ELECTRICALLY CONDUCTIVE COMPOSITIONS

Jerome H. Perlstein, Rochester, and Neil F. Haley, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 341,418, Jan. 21, 1982, Pat. No. 4,439,505. This application Nov. 21, 1983, Ser. No. 553,931

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—58 **6 Claims**

1. An electrographic element having a conductive layer comprising an electrically insulating polymer and a charge transfer complex characterized in that the charge transfer complex is (a) in the form of dendrite crystals throughout the polymer and (b) is a salt consisting of a cation of 2-(4,5-dihydronaphtho[1,2-d]-1,3-dithiol-2-ylidene)-4,5-dihydronaphtho[1,2-d]-1,3-dithiole and an anion selected from the group consisting of 7,7,8,8-tetracyanoquinodimethane, ClO_4^-, BF_4^-, PF_6^-, F^-, Cl^-, I^-, and I_3^-.

4,478,923

FUSIBLE ELECTROSTATICALLY ATTRACTABLE TONER

Pierre R. De Roo, Schoten; Yvan K. Gilliams, Hever, and Francine Van Gijsel, Beveren-Waas, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jan. 13, 1983, Ser. No. 457,569

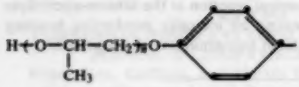
Claims priority, application United Kingdom, Jan. 19, 1982, 8201508

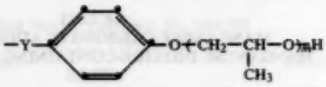
Int. Cl.³ G03G *9/08*

U.S. Cl. 430—110 **10 Claims**

1. A toner composition of electrostatically attractable powder particles fusible by the simultaneous application of heat and pressure, said particles having a melt viscosity at 140° C. in the range of 10^5 to 10^6 mPa.s and an average particle size in the range of 1 to 50 μm, said toner composition comprising a colouring substance and an amount exceeding 80% of its total volume of a mixture of:

(1) a polyester resin derived from fumaric acid, or from a mixture of fumaric acid and isophthalic acid containing at least 95 mole % of fumaric acid, and a polyol blend of propoxylated bisphenol according to the formula:



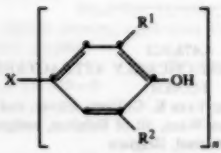


wherein Y represents an alkylidene group having from 1 to 4 C-atoms, and m and n are integers with the proviso that the average sum of m and n is from 2 to 7, said polyester resin being derived from amounts of acid and polyol such that the number of carboxyl groups to hydroxyl groups is in the ratio of 1.2:1 to 0.8:1, and having a melting point (Tm) not more than 80° C. and a glass transition temperature (Tg) between 30° and 60° C.;

(2) a polyester derived from fumaric acid and bisphenol according to the formula:

wherein Y represents an alkylidene group having from 1 to 4 C-atoms, and said polyester has a melting point (Tm) between 70° and 130° C. and a glass transition temperature (Tb) between 35° and 60° C.;

(3) a sterically-hindered phenol according to the formula:



wherein R^1 and R^2 (same or different) each represent an aliphatic group containing from 1 to 20 carbon atoms and X is a substituted alkyl, alkenyl, alkynyl or aryl group, containing as substituent a carboxylic ester, phosphonate ester, phosphate ester, sulfate ester or sulfonate ester group, and n is an integer from 1 to 4; and

(4) a pigment for controlling the melt viscosity having a density ($g.cm^{-3}$) larger than 1.8 at 20° C. and an average grain size in the range of 0.1 to 10 μm,

wherein the weight ratio of (1) to (2) is in the range of 1/4 to 4/1, the sum of the contents of resins (1)+(2) is at least 57% by volume of the toner particles, the content of (3) is between 0.25 and 18% by volume of the toner particles, and the content of said pigment is between 2.5 and 42% by volume of the toner particles.

4,478,924

PROCESS FOR TRANSFERRING A PIGMENT IMAGE USING A SPACER

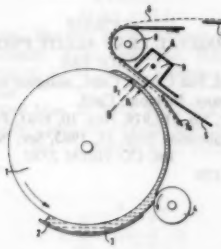
Roland Moraw, and Renate Schaedlich, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,456

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3043736

Int. Cl.³ G03G *13/16*

U.S. Cl. 430—126 **9 Claims**



1. A process for transferring a pigment image produced by treating an electrostatic charge image with a liquid developer, from a charge image carrier to a copy carrier with the aid of an electric field, said process comprising transferring the liquid developer layer which has a pigment distribution arranged according to the image, across an air gap having a gap width lying in the range from 5 to 50 μm, said air gap being established by inserting a spacer built in as part of the copy machine between the charge image carrier and the copy carrier, said spacer having a contact area not greater than 10 percent of the area of the copy carrier.

4,478,925

METHOD OF PREPARING CARRIER PARTICLES FOR ELECTROGRAPHIC MAGNETIC BRUSH DRY DEVELOPMENT

Edward T. Miskinis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,946

Int. Cl.³ G03G *9/10*

U.S. Cl. 430—137 **4 Claims**

1. A method of preparation of resin-coated ferromagnetic carrier particles for electrographic development which comprises agitating a dry mixture of ferromagnetic carrier particles and resin particles in the presence of a magnetic field and thereafter heating the mixture to a temperature and for a time sufficient to form a discontinuous bonded coating of the resin on the ferromagnetic particles.

4,478,926

ZINC SULFONATES AND THEIR USE IN DIAZOTYPY

Peter Muller, and Henry Mustacchi, both of Port Washington, N.Y., assignors to Andrews Paper & Chemical Co., Inc., Port Washington, N.Y.

Division of Ser. No. 334,722, Dec. 28, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,173

Int. Cl.³ G03C *1/60*

U.S. Cl. 430—178 **24 Claims**

1. A method for improving diazotype materials having a light sensitive diazotype coating which comprises a photosensitive diazonium salt, which comprises:

admixing in said coating a stabilizing proportion of a zinc salt of a sulfonic acid.

2. An improved light sensitive diazotype coating, which comprises:

in admixture, a light sensitive diazonium compound and a stabilizing proportion of a zinc salt of a sulfonic acid.

4,478,927

HEAT-DEVELOPABLE COLOR PHOTOGRAPHIC MATERIALS

Hideki Naito; Hiroshi Hara; Toshiaki Aono, and Kozo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanawawa, Japan

Filed Jun. 1, 1982, Ser. No. 384,118
Claims priority, application Japan, Jun. 1, 1981, 56-84164
The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.
Int. Cl.³ G03C 5/54, 1/10, 1/40
U.S. Cl. 430—203 26 Claims

1. A heat developable color photographic material, comprising:

a support having a surface;

a light-sensitive layer on the surface, the layer being comprised of:

a light-sensitive silver halide;

an organic silver salt;

a binder;

a dye releasing redox compound which is immobilized in said binder, and which releases a diffusible dye represented by the general formula:

$$R—SO_2—D \qquad (I)$$

wherein R represents a reducing group capable of being oxidized by the organic silver salt; and D represents a dye portion for forming an image which does not contain a carboxylic acid group or a sulfonic acid group; and

wherein the support is characterized by its ability to receive a released dye.

4,478,928

APPLICATION OF ACTIVATED ARYLHYDRAZIDES TO SILVER HALIDE PHOTOGRAPHY

Thomas C. Hess, and Karl E. Wiegers, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1983, Ser. No. 493,480
Int. Cl.³ G03C 1/28, 1/36
U.S. Cl. 430—217 34 Claims

1. A radiation sensitive silver halide emulsion containing an arylhydrazide comprised of an acyl group linked to a ring carbon atom of an aryl group by a hydrazo moiety having one of its nitrogen atoms sulfinic acid radical substituted and a hydrogen atom bonded to the other of its nitrogen atoms, said sulfinic acid radical substituent being of the formula:

where Ar^1 is an aromatic group.

4,478,929

DYE IMAGE TRANSFER FILM UNIT WITH TABULAR SILVER HALIDE

Cynthia G. Jones, Bergen, and Cliff O. Hill, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 430,092, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 320,911, Nov. 12, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,911
Int. Cl.³ G03C 5/54, 1/40
U.S. Cl. 430—217 42 Claims

1. In a photographic image transfer film unit comprising

a support,

a negative working emulsion layer located on said support containing a dispersing medium and radiation sensitive silver halide grains,

located in said emulsion layer or in a layer adjacent thereto a positive working dye image providing material capable of providing transferred image dye in the absence of silver halide development, and

a receiving layer for providing a viewable transferred dye

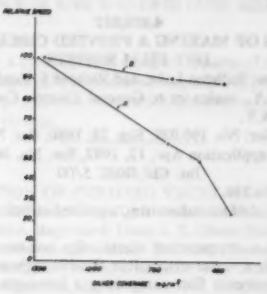


image following imagewise exposure and processing of said emulsion layer,

the improvement wherein at least 50 percent of the total projected area of said radiation sensitive silver halide grains is provided by tabular silver halide grains having a thickness of less than 0.5 micron, a diameter of at least 0.6 micron, and an average aspect ratio of greater than 8:1.

4,478,930

PRESENSITIZED LITHOGRAPHIC PRINTING PLATES

Keisuke Shiba; Sho Nakao, and Shigeo Koizumi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1982, Ser. No. 439,250
Claims priority, application Japan, Nov. 5, 1981, 56-177610
Int. Cl.³ G03C 1/76
U.S. Cl. 430—271 11 Claims

1. A presensitized lithographic printing plate comprising a support having a hydrophilic surface, and a non-silver light-sensitive layer capable of having formed therein a lipophilic image pattern and a direct positive light-sensitive silver halide emulsion layer provided on the support in that sequence, said non-silver light-sensitive layer being provided with an adjacent hydrophilic colloid layer in which a resin is dispersed in fine particle form, wherein said resin is a copolymer containing (A) a recurring unit derived from at least one monomer acrylic acid and methacrylic acid, and (B) a recurring unit derived from at least one monomer of an aralkyl acrylate and an aralkyl methacrylate, the resin having a particle size of 0.01 to 10 microns, and the amount of the resin being about 1 to 10 parts by weight per 10 parts by weight of hydrophilic colloid.

4,478,931

PRECURLED FLEXOGRAPHIC PRINTING PLATE

Michael G. Fickes, Colts Neck, and Alan L. Shobert, Old Bridge, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1982, Ser. No. 424,473
Int. Cl.³ G03F 7/00
U.S. Cl. 430—309 8 Claims

1. A process for providing a permanent curl in a flexographic printing plate having solvent-insoluble, elastomeric printing reliefs prepared by liquid development, the printing plate comprising a flexible sheet support, and a photopolymerized layer of a photosensitive, elastomeric composition having

a dry thickness of about 0.005 inch to about 0.250 inch, the process comprising, after liquid development, the printing plate is dried at a temperature in the range of about 20° to 80° C. for 0.25 hour to 24 hours and is postexposed by overall exposing the dry printing relief to a source of actinic radiation for 1 to 30 minutes, at least the postexposure occurring while the printing plate is present on a curver cylinder surface from which is is capable of being detached.

4,478,932
PROCESS OF MAKING A PRINTED CIRCUIT USING DRY FILM RESISTS

John J. Keane, Ballston Lake, and Richard F. Zopf, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 190,029, Sep. 23, 1980, Pat. No. 4,341,859. This application Apr. 12, 1982, Ser. No. 367,679
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—314 **5 Claims**

1. A method of manufacturing a printed circuit board, which comprises:

(i) covering a copper-clad electrically non-conducting substrate with a water-dispersible flexible apparently dry but tacky photoresist film comprising a homogeneous mixture of:

(a) colloidal droplets of a solution in a solvent comprising acetone, methylene chloride, methylformate or propylene chloride of a polyaryliodonium or sulfonium salt of a complex halogenide latent catalyst dispersed in a continuous aqueous phase containing

(b) a water-soluble normally solid polyvinyl alcohol as film-forming component, and

(c) an effective amount of a water-soluble thermosetting polymethylol compound to cross-link said polyvinyl alcohol to water-insoluble state at elevated temperatures therefor,

the amount of said latent catalyst being sufficient to catalyze the cross-linking action of said polymethylol compound when said emulsion is dried and irradiated with ultraviolet light and heated simultaneously with or subsequent to said irradiation;

(ii) projecting with ultraviolet light the design of the circuitry to be formed and simultaneously therewith or thereafter heating the film until the polyvinyl alcohol in the thus-irradiated portion of said film has cross-linked to water-insoluble state;

(iii) washing said film with water thereby removing the unexposed portion of said resist film and exposing copper; and

(iv) etching away the copper thereby exposed thereby forming the desired circuitry.

4,478,933
MULTI-LAYER X-RAY SCREENS

Jacob G. Rabatin, Montville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 371,832, Apr. 26, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 540,940
Int. Cl.³ G03C *1/76*
U.S. Cl. 430—496 **4 Claims**

1. An improved X-ray screen comprising a double emulsion silver halide photographic film positioned between a pair of contiguous phosphor layers having a rare earth oxyhalide phosphor with the general formula:

$$LnOX:Tm^{+3}$$

wherein

Ln is one or more of La and Gd,

X is one or more of Cl and Br,

Tm is present as sole activator at a concentration in the range from 0.0005 to 0.001 moles per mole of the selected oxyhalide,

said phosphor exhibiting modified ultraviolet emission to reduce crossover effects without significant reduction in film speed and further providing more ultraviolet emission at 301 nanometers wavelength accompanied by increased screen brightness.

4,478,934
DETERMINATION OF ADENOSINE BY IMMUNOASSAY INVOLVING ACYLATION OF THE ADENOSINE

Tomokazu Sato, Choshi, and Michio Ui, Sapporo, both of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba, Japan

Filed Jul. 9, 1982, Ser. No. 396,863
Claims priority, application Japan, Jul. 15, 1981, 56-111324
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 **6 Claims**

1. A method for determining quantitatively the adenosine content in a sample by immunoassay, comprising the steps of:

(1) adding an acylating agent to a liquid sample and to a standard adenosine solution thereby acylating hydroxyl groups at the 2'-position and the 3'-position of each adenosine;

(2) diluting each of the reaction mixtures which have undergone said acylation by addition of a buffer and then carrying out antigen-antibody reactions by mixing (a) each of these reaction mixtures with (b) a predetermined amount of labelled 2',3'-diacyladenosine and (c) a predetermined amount of anti-adenosine antibodies derived from an antigen comprising adenosine bound at the 2'- and the 3'-hydroxyl groups to a carrier protein through dicarboxylic acid residues; and

(3) subsequently separating, in each of the reaction mixtures, free labelled adenosine from the labelled adenosine bound to the anti-adenosine antibody and measuring the quantity of the label in either one of the labelled adenosines to calculate the adenosine content in the sample therefrom.

4,478,935
MANGANESE-CONTAINING ANTIBIOTIC AGENTS

Robert D. Williams; David R. Bright; Vernon V. Young, and Jerome L. Martin, all of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 196,722, Oct. 8, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 422,408
Int. Cl.³ C12P *19/60, 19/56, 17/18*
U.S. Cl. 435—75 **19 Claims**

1. A method for producing a manganese complex of a polyether antibiotic, said method comprising:

(a) fermenting a nutrient broth inoculated with a Streptomyces microorganism capable of producing by growth in the broth a polyether antibiotic for a period of time and under suitable fermentation conditions in order to produce said polyether antibiotic in said fermentation broth; and

(b) providing in said antibiotic containing fermented broth a water-soluble manganese salt in an amount sufficient to form a manganese complex of said polyether antibiotic, which complex is insoluble in the fermented broth.

4,478,936
IN VITRO ENZYMATIC PROCESS FOR PRODUCING GLUCURONIDES

Walter C. Herlihy, Cambridge, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Filed Aug. 20, 1982, Ser. No. 409,986
Int. Cl.³ C12P *19/56, 19/46, 17/02, 15/00*
U.S. Cl. 435—78 **4 Claims**

1. An in vitro enzymatic process for preparing the O-β-D-glucuronide of an anticholinergic compound which has a primary alcohol, which comprises reacting a solution of D-glucuronic acid with a solution of said compound, and a solution of β-glucuronidase, for a time sufficient to form the O-β-D-glucuronide, and isolating said glucuronide.

4,478,937

PLASMID AND PRODUCTION THEREOF

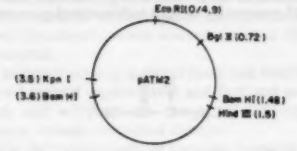
Masakazu Kikuchi, 4-16, Higashitokiwadai 7-chome, Toyonocho, Toyono-gun, Osaka, Japan (563-01); Takaki Hayakawa, 6-31, Zuiko 1-chome, Higashiyodogawa-ku, Osaka, Japan (533), and Makoto Kida, 138-3, Aza-midorigaoka, Yamahara, Kawanishi, Hyogo, Japan (666-01)

Filed Apr. 20, 1982, Ser. No. 370,273

Claims priority, application Japan, Apr. 28, 1981, 56-64369

Int. Cl.³ C12N *15/00, 1/00, 1/20;* C12P *21/00, 19/34*

U.S. Cl. 435—172.3 5 Claims



1. An biologically pure plasmid pATM2 which is obtained from a microorganism belonging to the genus micromonaspora and is characterized by the following properties:

(1) Molecular weight: approximately 4.87±0.05 megadaltons

(2) Shape: circular

(3) Restriction endonuclease cleavage sites: Eco RI (0/4.9), Bgl II (0.72), Bam HI (1.48 and 3.6), Hind III (1.5) and Kpn I (3.8)

(4) Sensitivity to restriction endonucleases:

Restriction endonuclease	Number of Cleavage Sites
Bam HI	2
Bgl II	1
Kpn I	1
Sal I	≧3
Eco RI	1
Hind III	1
Sma I	≧3

4,478,938

PROCESS FOR CROSSLINKING POLYAMINES

Harold H. Freedman, Newton Center, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1984, Ser. No. 585,744

Int. Cl.³ C12N *11/06;* C07G *7/00;* C08G *18/00, 18/28*

U.S. Cl. 435—181 12 Claims

1. A process for crosslinking a polyalkylenepolyamine wherein a polyisocyanate is contacted with an aqueous liquid comprising a polyalkylenepolyamine which is at a specific pH and which is subjected to a sufficiently high rate of agitation to yield a water-swellable, essentially water-insoluble gel.

11. A process for covalently immobilizing a protein wherein said protein is contacted with a polyalkylenepolyamine and a polyisocyanate in an aqueous liquid which is at a specific pH and which is subjected to a sufficiently high rate of agitation to yield a water-swellable, essentially water-insoluble gel.

4,478,939

SPS, SPS-ASE AND METHOD FOR PRODUCING SPS-ASE

Jens L. Adler-Nissen, Gentofte; Henrik Gürtler, Lyngby; Georg W. Jensen, Bagsvaerd; Hans A. S. Olsen, Vanlose; Steen Riisgaard, Vaerlose, and Martin Schülein, Copenhagen, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Dec. 24, 1981, Ser. No. 334,329

Int. Cl.³ C12N *9/24, 9/40, 9/42;* C07G *17/00;* A23J *1/14;* A23L *2/34*

U.S. Cl. 435—200 7 Claims

1. SPS-ase, a carbohydrase complex capable of decomposing the water soluble polysaccharide component of soy remanence that binds to proteins into decomposition products incapable of attaching to protein.

4,478,940

PRODUCTION OF PURIFIED VEGETABLE PROTEIN

Jens L. Alder-Nissen, Gentofte; Henrick Gürtler, Lyngby; Georg W. Jensen, Bagsvaerd; Hans A. S. Olsen; Steen Riisgaard, both of Vaerlose, and Martin Schülein, Copenhagen, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Dec. 24, 1981, Ser. No. 334,330

Int. Cl.³ C12N *9/24, 9/40, 9/42;* C07G *17/00;* A23J *1/14;* A23L *2/34*

U.S. Cl. 435—209 4 Claims

1. An enzyme composition agent adapted to degrade and solubilize polysaccharides in vegetable materials comprising SPS-ase, an enzyme capable of degrading the water soluble polysaccharide which binds to soy protein, said enzyme composition being further characterized by being essentially free from proteolytic activity, and by presence therein of activity against cellulose, pectin and hemicellulose in addition to SPS.

4,478,941

METHOD FOR DETERMINING COMPONENT RATIOS EMPLOYED TO PREPARE POLYMERS

Douglas K. Hillshafer, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1982, Ser. No. 444,632

Int. Cl.³ C09K *3/00;* G01N *31/22, 33/44*

U.S. Cl. 436—56 6 Claims

1. A method for determining the mixing ratio of two or more compositions containing at least one component in each of such compositions which compositions are mixed together and subsequently cured to form a polymer; which method comprises:

(A) adding a separate tracer compound in a known quantity to each of said compositions each of said separate tracers having different compositions;

(B) mixing and curing each of said compositions and respective tracers to form a cured polymer;

(C) subjecting a representative sample of the cured polymer to a condition for preparing small particles thereof;

(D) subjecting said small particles to solvent extraction with a solvent system for a time sufficient to extract analyzable quantities of said different tracer compounds;

(E) separating said solvent from the polymer particles;

(F) analyzing said separated solvent so as to determine the ratio of each of said different tracer compounds; and

(G) calculating the ratio of said composition employed in the preparation of said polymer from the analysis of the tracer compounds determined in step (F); and wherein

(1) said solvent system is one

(a) in which each of the different tracer compounds is soluble and

(b) which does not react with any of the different tracer compounds or the polymer; and

(2) each of said different tracer compounds

(a) is not reactive with any of the components which are blended together to prepare the polymer;

(b) is not reactive with any other tracer compound employed; and

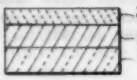
(c) has a boiling point above the temperature at which the polymer is prepared or post cured, whichever is higher.

4,478,942

QUANTITATIVE ANALYSIS FILM AND A METHOD FOR COLORIMETRIC ANALYSIS USING THE SAME

Harumi Katsuyama; Yoshikazu Amano, and Asaji Kondo, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Saitama, Japan

Filed Feb. 26, 1982, Ser. No. 352,969
Claims priority, application Japan, Feb. 27, 1981, 56-028158
Int. Cl.³ G01N *33/52*; C12Q *1/28*
U.S. Cl. 436—66 18 Claims



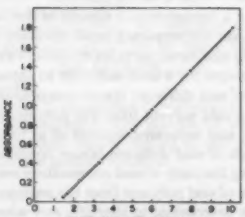
13. A method for quantitatively assaying hydrogen peroxide of a precursor capable of forming hydrogen peroxide contained in a test sample colorimetrically which comprises bringing said test sample into contact with a N,N-disubstituted aniline cationic dye-forming color indicator for detecting hydrogen peroxide comprising components capable of forming said colored cationic dye by chemical mutual action in the presence of hydrogen peroxide and then binding the cationic dye formed to an anionic polymer to fix the formed cationic dye.

4,478,943

METHOD FOR MEASURING SILVER ION CONCENTRATION IN A SOLUTION

Akira Abe, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1982, Ser. No. 345,841
Claims priority, application Japan, Feb. 4, 1981, 56-15388
Int. Cl.³ G01N *21/00*
U.S. Cl. 436—80 3 Claims



1. A method for measuring the silver concentration of a thiosulfate ion-containing solution, comprising providing for hypohalogenite ion to exist in an alkalized solution containing both silver ion and thiosulfate ion, and turbidometrically measuring the concentration of the slightly soluble silver salt thusformed.

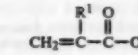
4,478,944

ANALYTICAL ELEMENT CONTAINING A BARRIER ZONE AND PROCESS EMPLOYING SAME

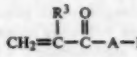
Robert C. Gross, and Susan C. Gross, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,112
Int. Cl.³ G01N *21/78, 33/52, 33/66*
U.S. Cl. 436—95 14 Claims

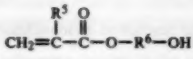
8. A process, for quantitative analyte determination in whole blood, comprising bringing a sample of the blood into contact with a multizone element containing a porous spreading zone separated from a reagent zone by a barrier zone, said barrier zone comprising a non-porous film comprising a polymer of from 30 to 95 percent by weight polymerized monomer having the structure



from 0.25 to 30 percent by weight polymerized monomer having the structure



and from 0.1 to 50 percent by weight polymerized monomer having the structure

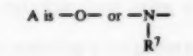


wherein:

R^1, R^3, and R^5 are independently selected from the group consisting of hydrogen and methyl,

R^2 is alkyl of from 1 to 16 carbon atoms,

R^4 and R^6 are independently selected from the group consisting of alkylene groups having from 1 to 6 carbon atoms,



wherein R^7 is hydrogen, alkyl of 1 to 10 carbon atoms, or cycloalkyl of 5 to 10 carbon atoms, and

M is $NR^8R^9H^+X^-$ or SO_3^-X wherein R^8 and R^9 are independently selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and X is a counterion.

4,478,945

METHOD FOR EVALUATING THYROID FUNCTION

Wai-Nang P. Lee, 6502 Ranchito Ave., Van Nuys, Calif. 91401; Michael D. Harpen, 3701 Caryhe Close, Apt. 989, Mobile, Ala. 36609, and Jeffry A. Siegel, Dept. of Radiology, Medical Physical Division, Center, Los Angeles, Calif. 90024

Filed Jul. 28, 1981, Ser. No. 287,701
Int. Cl.³ G01N *33/54, 33/60*; G01T *1/00*
U.S. Cl. 436—500 10 Claims

1. A method for evaluating thyroid function from plasma having a known total thyroxine concentration, said total thyroxine concentration, including free thyroxine and bound thyroxine, said method comprising the steps of:

preparing a first solution having a known amount of radioactive thyroxine and known volumes of said plasma and a buffer, said solution having a first total thyroxine concentration (ρT_1) and a first free thyroxine concentration (ρF_1) where ρF_1 is less than a known constant (k_2);

preparing a second labeled solution having a known amount

of radioactive thyroxine and known volumes of said plasma and buffer, said second solution further including a known amount of added thyroxine intended to provide a secon solution having a total thyroxine concentration (ρT_2) which is greater than ρT_1 and a second free thyroxine concentration (ρF_2) which is greater than ρF_1 but less than said known constant (k_2);

measuring the radioactivity of said first and second solutions;

adding a known amount of partitioning material having a known partition coefficient (α) and inclusion volume (I) to said solutions after said labeled thyroxine has reached equilibrium distribution between free and bound states;

mixing said paritioning material with said solutions for a sufficient time to allow equilibrium distribution of said labeled thyroxine between said solution and said partitioning material;

settling said partitioning material from said solutions to form first and second supernatants and first and second solids phases, said solids phases having solution equal to said inclusion volume contained therein;

measuring the radioactivity in constant fractions of said first and second supernatants; and

determining the TBG binding capacity and free thyroxine concentration for said plasma from the measured radioactivity of said first and second solutions and said first and second supernatants.

4,478,946

CARRIER BOUND IMMUNOSORBENT

Kirsten J. Van der Merwe, Stellenbosch, and Alfred Polson, Camps Bay, both of South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Jun. 25, 1982, Ser. No. 392,111

Claims priority, application South Africa, Jul. 2, 1981, 81/4481

Int. Cl.³ G01N *33/54, 33/56*

U.S. Cl. 436—518 **50 Claims**

1. A carrier-bound immunosorbent comprising a solid carrier body carrying an immobilized immuno-reactant, wherein the immunoreactant, being either an antigen or an antibody, is covalently bonded to a crosslinked proteinaceous film enveloping the carrier body in such a manner that immunologically active parts of the immunoreactant are present on its surface in a form in which they are available for immunosorption, wherein said film consists essentially of protein, partially hydrolysed protein, peptide or a combination thereof, crosslinked in situ with a crosslinking agent on the surface of the carrier body into a coherent film enveloping the surface and clinging thereto.

4,478,947

GAS PANEL SEAL GLASS

Robert A. Rita, Lake Katrine, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 174,058, Jul. 31, 1980, abandoned. This application Jun. 21, 1983, Ser. No. 505,025

Int. Cl.³ C03C *3/12*

U.S. Cl. 501—15 **7 Claims**

1. A non-crystallizing sealing glass composition, capable of forming a seal at about 425° C., consisting essentially of from about 75.50 to 84.00 wt. % PbO, from about 11.24 to 14.25 wt. % B_2O_3, 1.80 to 2.90 wt. % ZnO, and 2.6 to 9.4 wt. % Bi_2O_3, and β-eucryptite in an amount sufficient to provide a coefficient of expansion of about 83.5 to 71.5×10^{-7} C.$^{-1}$, said β-eucryptite used in the formulation of said non-crystallizing sealing glass composition being a powder having a maximum particle size less than 30 microns, said sealing glass composition being non-crystallizing in that essentially no crystallization occurs when the glass composition without the β-eucryptite is applied to a float glass substrate heated at about 5° C./minute until thermal fusing of the glass composition occurs, allowed to soak for 1 hour, and then allowed to cool, said sealing glass composition with the β-eucryptite having a glassy edge temperature no higher than 357° C.

4,478,948

PROCESS FOR IMPROVING THE ACTIVITY OF USED SUPPORTED SILVER CATALYSTS

Siegfried Rebsdat, Burg; Sigmund Mayer, Burgkirchen, and Josef Alfranseder, Hofschallern, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,142

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229541

Int. Cl.³ B01J *23/96*; C07D *301/10*

U.S. Cl. 502—25 **5 Claims**

1. A method for improving the activity of a used supported silver catalyst, used for the manufacture of ethylene oxide by reaction of ethylene with oxygen or air, which method consists essentially of:

(a) impregnating said used catalyst at a temperature from 80° C. to 150°0 C. and for 0.75 hour to 10 hours with an impregnating solution containing water, a water-miscible organic solvent selected from the group consisting of methanol, ethanol, propanol, and isopropanol, at least one compound of cesium, rubidium, or of cesium and rubidium in an amount providing from 50 mg to 1000 mg per kilogram of solution, said solution containing from 5 to 50 percent by weight of water;

(b) separating the impregnated catalyst from excess impregnating solution; and

(c) drying the impregnated catalyst.

2. A method as in claim 1 wherein said used catalyst is impregnated at a temperature from 90°0 C. to 130° C.

4. A method as in claim 1 wherein said impregnating solution contains from 10 to 40 percent by weight of water.

4,478,949

PARA-SELECTIVE ZEOLITE CATALYSTS TREATED WITH SULFUR COMPOUNDS

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 277,486, Jun. 26, 1981, Pat. No. 4,365,104. This application Aug. 30, 1982, Ser. No. 413,190

Int. Cl.³ B01J *29/06, 29/28, 27/14*

U.S. Cl. 502—77 **9 Claims**

1. A process for treating zeolite based catalysts, said catalysts comprising a crystalline zeolite material characterized by a silica to alumina ratio of at least 12 and a constraint index of from about 1 to 12 and from about 0.25% to 25% by weight of a modifying oxide selected from magnesium oxide, phosphorus oxide and mixtures of said oxides, said process comprising contacting said catalyst with a sulfur-based treating agent selected from hydrogen sulfide and sulfur dioxide under conditions capable of enhancing the para-selectivity of said catalysts in the conversion of aromatic compounds to dialkyl-substituted benzene compounds.

4,478,950

ACTIVITY ENHANCEMENT OF HIGH SILICA ZEOLITES BY THERMAL TREATMENT WITH ALKALINE ALUMINATE

Pochen Chu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 288,604, Jul. 30, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 488,505
Int. Cl.³ B01J 29/28, 37/00
U.S. Cl. 502—85 27 Claims

1. A method for enhancing the activity of a high silica-containing crystalline zeolite material having a silica-to-alumina ratio greater than 20 which comprises contacting said material with a solution containing organic cations selected from the group consisting of tetraalkylammonium, cations of alkylamines and mixtures thereof and aluminum ions for a period of time of from 1 hour to 30 days at a temperature of from 50° C. to 300° C. at autogenous pressures and at a pH of at least 7, calcining said solution contacted material at a tempeature of from 200° C. to 600° C., ion exchanging said calcined material, and calcining said ion-exchanged material at a temperature of from 200° C. to 600° C.

3. The method of claim 1 wherein the organic cations comprise tetraalkylammonium cations.

12. The method of claim 1 wherein the zeolite material comprises an acid zeolite selected from the group consisting of ZSM-5, ZSM-11 and ZSM-12.

4,478,951

TITANIUM TRICHLORIDE CATALYST COMPONENT AND THE PROCESS FOR THE PRODUCTION THEREOF

Terrence Huff, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1983, Ser. No. 455,168
Int. Cl.³ C08F 4/64
U.S. Cl. 502—108 21 Claims

19. The method of preparing a non-friable, highly active Ziegler-type $TiCl_3$ catalyst composition comprising:

(a) contacting $TiCl_4$ with an organoaluminum compound at a temperature in the range of about −50° C. to about 30° C. to produce a $TiCl_3$ reduced solid product,

(b) contacting the reduced solid $TiCl_3$ product with an amount of a mixture of propylene and linear C_8–C_{18} alpha-olefin under polymerization conditions to obtain a reduced $TiCl_3$ solid product containing about 5 to 35 weight percent of prepolymerized copolymer of propylene and linear C_8–C_{18} alpha-olefin based on the weight of $TiCl_3$, wherein the ratio of the infrared spectrum of said copolymer at 720 cm^{-1}: to the infrared spectrum spectrum of said copolymer at 975 cm^{-1} is in the range of 0.04 to 0.20, and

(c) treating said prepolymerized reduced solid with one of (a) a chlorinated hydrocarbon having at least 2 carbon atoms and a Lewis base complexing agent of (b) $TiCl_4$ and a Lewis base complexing agent to convert the prepolymerized $TiCl_3$ reduced solid to a substantially non-friable highly active, crystalline prepolymerized $TiCl_3$ composition.

4,478,952

SUPPORTED CATALYST FOR OLEFIN POLYMERIZATION

Mark P. Mack, and Charles T. Berge, both of Ponca City, Okla., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 18, 1983, Ser. No. 476,906
Int. Cl.³ C08F 4/64, 4/62, 4/68
U.S. Cl. 502—110 15 Claims

1. A method for forming a supported activated catalyst for olefin polymerization comprising

(a) contacting a mixture of magnesium metal and magnesium dihalide with alkyl halides or aryl halides or mixtures of these to form an organometallic substance in-situ;

(b) contacting transition metal alkoxides, siloxides or mixtures of these with (a), then

(c) adding alkylating agents to the product of (b) to form a polymerization catalyst, with the proviso that substantially all unreacted alkyl or aryl halides are removed before step (c).

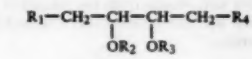
4,478,953

POLYMERIZATION PROCESS OF OPTICALLY ACTIVE POLYMER AND CATALYST THEREFOR

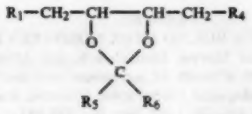
Heimei Yuki, Sakai, and Yoshio Okamoto, Amagasaki, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Mar. 3, 1983, Ser. No. 471,584
Claims priority, application Japan, Mar. 9, 1982, 57-36909
Int. Cl.³ C08F 4/46, 4/48
U.S. Cl. 502—155 8 Claims

1. A polymerization catalyst for preparing an optically active polymer, comprising a complex of (A) an asymmetric ligand compound of the formula (I) or formula (II):

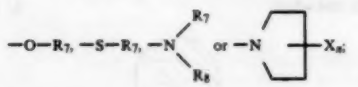


(I)



(II)

in which R_1 and R_4 each is



R_2, R_3, R_5, R_6, R_7 and R_8 each is alkyl having 1 to 10 carbon atoms; X is hydrogen, alkyl having 1 to 10 carbon atoms or halogen; and n is a number of 1 to 4; and (B) an anionic initiator capable of forming a complex with said ligand compound and effective for initiating polymerization of monomers containing a vinyl group, said anionic initiator containing a carbanion or a nitrogen anion derived from a secondary amine.

4,478,954

SYNTHESIS GAS REACTION

John F. Connolly, Glen Ellyn; Arnold N. Wennerberg, Chicago, and Robert F. Waters, Calumet City, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 23, 1983, Ser. No. 497,401
Int. Cl.³ C07C 1/04, 27/06
U.S. Cl. 518—700 28 Claims

1. A method for converting carbon monoxide and hydrogen to hydrocarbons of high light olefin and alcohol content, comprising combining carbon monoxide and hydrogen in synthesis proportions and under synthesis conditions comprising temperatures in the range of from about 290° C. to about 350° C. in a slurry in a liquid that is substantially sulfur-free and inert under the synthesis conditions, of an active carbon catalyst comprising a substantially uniform dispersion of at least one of a chromium component, an aluminum component, a manganese component or a tungsten component in a porous carbon matrix and elemental iron either deposited thereon or substantially uniformly dispersed therein, wherein the concentration of active carbon in the catalyst is from about 20 to about 90 weight percent, based on the weight of the catalyst, wherein

the concentration of elemental iron in the catalyst is from about 5 to about 50 weight percent, based on the weight of the catalyst, wherein the total concentration of the chromium component, the aluminum component, the manganese component or tungsten component or a combination thereof in the catalyst is from about 5 to about 40 weight percent, based on the weight of the catalyst and calculated as the elemental metal or metals, and wherein each of the chromium, aluminum, manganese and tungsten components that is present is in the form of the elemental metal, its oxide or a combination thereof.

4,478,955

UPGRADING SYNTHESIS GAS

Frederick A. Pesa, Aurora, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 332,772, Dec. 21, 1981, abandoned. This application Nov. 16, 1983, Ser. No. 552,556

Int. Cl.³ C07C *1/04, 27/06*

U.S. Cl. 518—713 **44 Claims**

1. A process for the upgrading of synthesis gas to obtain selectivity to olefins and carboxylic acids comprising contacting carbon monoxide and hydrogen in the vapor phase at a reaction temperature of at least 250° C. and a reaction pressure of at least 500 psi with a catalyst of the formula

$$M_aA_bRuCu_cN_zO_x$$

wherein

A is an alkali metal or an alkaline earth metal or mixtures thereof,

wherein

M is Ce, Cr, Fe, Mn, Mo, Zn or mixtures thereof, and

wherein

a is 0 to about 0.5

b is about 0.002 to about 2,

c is about 0.5 to about 3,

z is 0 to about 1 weight percent and

x is the number of oxygens needed to fulfill the valence requirements of the other elements.

4,478,956

PROCESS FOR PREPARING BISPHENOLS USING PYRIDINEALKANETHIOL DERIVATIZED SULPHONATED CATION EXCHANGE RESINS

Takao Maki, Fujisawa; Tetsuo Masuyama, Machida; Toshiharu Yokoyama, and Yoshiko Fujiyama, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Division of Ser. No. 279,692, Jul. 2, 1981, Pat. No. 4,423,252. This application Aug. 4, 1983, Ser. No. 520,214

Claims priority, application Japan, Aug. 7, 1980, 55-108595; Aug. 12, 1980, 55-110785

Int. Cl.³ B01J *31/10*

U.S. Cl. 521—32 **3 Claims**

1. A sulfonic acid type cation exchange resin 2–20% modified with a pyridinealkanethiol of the formula:

$$Py-(CH_2)_nSH$$

wherein n is a positive integer and Py is a 3-pyridyl when n is 1, or 2-, 3- or 4-pyridyl when n is more than 1.

4,478,957

PROCESS FOR THE PRODUCTION OF HIGHLY RESILIENT, COLD-CURING POLYURETHANE FOAMS

Bernd-Juergen Klietsch, Gelsenkirchen-Buer; Hans-Joachim Kollmeier, Essen; Helmut Lammerting, Herbede, and Rolf-Dieter Langenhagen, Hattingen Niederwenigern, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,579

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234462

Int. Cl.³ C08G *18/14, 18/72, 18/32, 18/48*

U.S. Cl. 521—112 **16 Claims**

1. In a process for the manufacture of highly resilient, cold-curing polyurethane foams wherein polyisocyanates which are at least difunctional are reacted with polyols having at least two hydroxyl groups per molecule, of which at least 40% on the average are primary hydroxyl groups, the polyols having an equivalent weight per hydroxyl group of 700 to 3,000, in the presence of catalysts, blowing agents, emulsifiers, and foam stabilizers, the improvement which comprises using as the foam stabilizer, polysiloxane-polyoxyalkylene block copolymers wherein

(a) the polysiloxane block is linear or branched and contains an average of 4 to 25 silicon atoms, wherein the organic radicals linked to the silicon atoms are polyoxyalkylene or methyl radicals and up to 30% of the methyl radicals can be replaced by radicals selected from the group consisting of substituted alkyl radicals with 1 to 4 carbon atoms, phenyl radicals, and mixtures thereof;

(b) the polyoxyalkylene portion consists of at least two polyoxyalkylene blocks, A_1 and A_2, which are formed from oxyethylene and oxypropylene units, wherein block A_1 is formed from 45 to 100 mole percent of oxyethylene units and 55 to 0 mole percent of oxypropylene units and block A_2 is formed from 0 to 50 mole percent of oxyethylene units and 100 to 50 mole percent of oxypropylene units, the molecular weight of the polyoxyalkylene blocks A_1 and A_2 in each case being 150 to 1,200 and the molar ratio of blocks A_1:A_2 falling in the range of 20:80 to 80:20, and

(c) the polysiloxane block is linked to the polyoxyalkylene blocks by SiOC or SiC bridges, 1.5 to 10 polyoxyalkylene blocks being linked to each polysiloxane block on the average.

4,478,958

METHOD FOR PREPARING PHENOLIC FOAMS USING ANHYDROUS ARYL SULFONIC ACID CATALYSTS

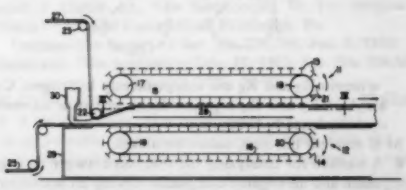
John D. Carlson, Bradford Woods; Edward W. Kifer, Trafford; Vincent J. Wojtyna, Lyndora, and James P. Colton, Monroeville, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 282,021, Jul. 10, 1981, abandoned. This application Jul. 9, 1982, Ser. No. 396,707

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—121 **12 Claims**



1. A process for preparing phenolic foam having cell walls substantially free of perforations and ruptures caused by water

comprising foaming and curing a foamable phenolic resole composition of the type comprising an aqueous phenolic resole, blowing agent, surfactant, and acid curing catalyst wherein the foamable phenolic resole composition contains at least about 5 percent by weight water and wherein the acid curing catalyst is an anhydrous aryl sulfonic acid that has a pKa less than about 2.0 and that reduces the compatibility of the aqueous phenolic resole with water sufficiently enough to prevent perforations and ruptures in the cell walls of the phenolic foam caused by water and wherein the anhydrous aryl sulfonic acid is used as a liquid in an amount sufficient to prevent perforations and ruptures in the cell walls of the foam caused by water said amount being at least 6 percent by weight of the foamable phenolic resole composition.

4,478,959

AMINO AND AMIDO DIVALENT METAL CARBOXYLATES USEFUL AS CATALYSTS FOR POLYURETHANE FORMULATIONS

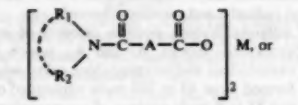
Ibrahim S. Bechara, Macungie, and Rocco L. Mascioli, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 29, 1983, Ser. No. 537,471

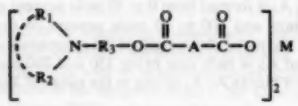
Int. Cl.³ C08G *18/14, 18/18;* C07F *7/22*

U.S. Cl. 521—124 **21 Claims**

1. Compounds corresponding to either of the formulae:



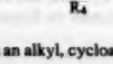
M, or



M

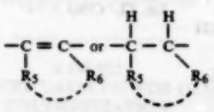
wherein R_1 and R_2 are independently C_1–C_{20} alkyl, C_6–C_{20} cyclohydrocarbyl, C_2–C_{20} hydroxyalkyl or alkoxyalkyl, or R_1 and R_2 together with N form a nitrogen-containing heterocyclic ring of 5 or 6 atoms;

R_3 is a $—(CH_2)_n$ group where n is an integer from 2 or 6 or a



group where R_4 is an alkyl, cycloalkyl or aryl group of up to 6 carbon atoms;

A is



wherein R_5 and R_6 are independently hydrogen, C_1–C_4 alkyl or R_5 and R_6 together form part of a six-member cyclohydrocarbyl ring, and

M is divalent tin, zinc, cobalt or nickel.

8. A method for catalyzing the reaction between an organic isocyanate and an organic compound having an active hydrogen which comprises reacting the organic isocyanate and the active hydrogen compound in the presence of a catalytic amount of the compound of claim 1.

4,478,960

DIPHENYLMETHANE DIISOCYANATE-BASED LIQUID POLYISOCYANATE MIXTURES CONTAINING URETHANE GROUPS, PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE PREPARATION OF FLEXIBLE POLYURETHANE FOAMS

Ingolf Buethe, Boehl-Iggelheim; Matthias Marx, Bad Durkheim; Gisbert Schleier, Ludwigshafen, and Reinhard Peters, Munich, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,257

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241450

Int. Cl.³ C08G *18/14, 18/70;* C07C *143/828*

U.S. Cl. 521—160 **6 Claims**

1. A liquid, urethane group-containing diphenylmethane diisocyanate-based polyisocyanate mixture having an isocyanate group content of 12 to 30 percent by weight obtained by reaction at a temperature of 0° C. to 100° C. of

(a) at least one polyoxypropylene polyoxyethylene polyol having a functionality of 2 to 4, a hydroxyl number of 10 to 65, and 5 to 30 percent by weight of oxyethylene based on total weight of the polyol

with

(b) a polyisocyanate selected from the group consisting of:

(1) a mixture of isomeric diphenylmethane diisocyanates and polyphenyl polymethylene polyisocyanate, containing from 60 to 95 percent by weight of diphenylmethane diisocyanates, and

(2) isomeric diphenylmethane diisocyanate containing 50 to 100 percent by weight of the 4,4'-isomer,

with the proviso that when the isocyanate mixture (1) is used, the polyol and the isocyanate are reacted in a ratio to provide from 0.001 to 0.19 equivalent hydroxyl group per equivalent of isocyanate group and when the isomeric diphenylmethane diisocyanates (2) are used, the polyol and the isocyanate are reacted in a ratio to provide from 0.001 to 0.19 equivalent hydroxyl group per equivalent isocyanate group followed by dilution of the reaction product with 10 to 60 percent by weight of a diphenylmethane diisocyanate-polyphenyl polymethylene polyisocyanate mixture containing 45 to 80 percent by weight of diphenylmethane diisocyanates.

6. Flexible polyurethane foams prepared using the liquid, urethane group-containing polyisocyanate mixtures of claim 1.

4,478,961

POLYVINYL CHLORIDE COMPOSITION

Masakazu Tanaka, Osaka, and Ken Murayama, Otsu, both of Japan, assignors to Toyo Boseki Kabushika Kaisha, Osaka, Japan

Filed Nov. 18, 1982, Ser. No. 442,705

Claims priority, application Japan, Nov. 18, 1981, 56-185914; May 13, 1982, 57-81166

Int. Cl.³ C08L *27/06;* A61F *1/00*

U.S. Cl. 523—105 **5 Claims**

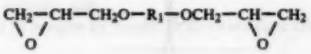
1. A polyvinyl chloride composition, which comprises 100 parts by weight of polyvinyl chloride and 5 to 150 parts by weight of a modified polyester having a number average molecular weight of 1,000 to 100,000 which is prepared from (A) a polyester having a carboxyl group at terminal thereof and containing an ester unit of total carbon atoms of 8 to 20 in the diol component and the dicarboxylic acid component, said polyester (A) having a number average molecular weight of 500 to 20,000 and having an acid value of 3 to 225, and (B) a compound having epoxy groups at both terminals thereof using an alkali metal salt of an aliphatic mono- or di-carboxylic acid having 6 to 50 carbon atoms as a catalyst.

5. A blood transmitting tube or blood handling device, which is produced by processing a polyvinyl chloride composition to form the desired tube or device, or by coating the polyvinyl chloride composition onto a conventional tube or device, said polyvinyl chloride composition comprising 100

parts by weight of a polyvinyl chloride and 5 to 150 parts by weight of a modified polyester having a number average molecular weight of 1,000 to 100,000 which is prepared from

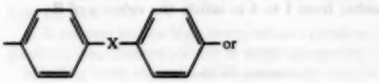
(A) a polyester having a carboxyl group at terminal thereof and containing an ester unit of total carbon atoms of 8 to 20 in the diol component and the dicarboxylic acid component, said polyester having a number average molecular weight of 500 to 20,000 and having an acid value of 3 to 225, and

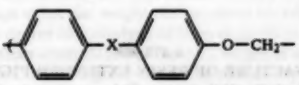
(B) a compound having epoxy groups at both terminals thereof selected from the group consisting of compounds of the formula:

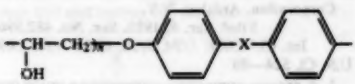


(I)

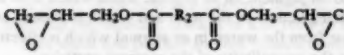
wherein R_1 is an alkylene having 2 to 50 carbon atoms, an aralkylene having 7 to 50 carbon atoms, an oxyalkylene having 2 to 50 carbon atoms, a group of the formula:





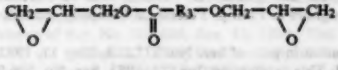


wherein X is isopropylidene, methylene, sulfonyl or oxy, and n is an integer of 1 to 10,



(II)

wherein R2 is an alkylene having 2 to 50 carbon atoms, an alkylene having 2 to 50 carbon atoms, an aralkylene having 7 to 50 carbon atoms, or an aromatic group having 6 to 30 carbon atoms, and



(III)

wherein R3 is an alkylene having 2 to 50 carbon atoms, a hydroxyalkylene having 2 to 50 carbon atoms, an aralkylene having 7 to 50 carbon atoms, or an aromatic group having 6 to 30 carbon atoms, using an alkali metal salt of an aliphatic mono- or di-carboxylic acid having 6 to 50 carbon atoms as a catalyst.

4,478,962

BINDER COMPOSITIONS COMPRISING FURFURYL ESTER AND FURFURYL ESTER-FURUYL ALCOHOL COMBINATIONS

Wayne D. Woodson, Danville, Ill., assignor to CL Industries, Inc., Danville, Ill.

Continuation-in-part of Ser. No. 352,376, Feb. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 306,965, Sep. 30, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,835

Int. Cl.³ C08F *32/06*; B22C *11/22*

U.S. Cl. 523—144 **23 Claims**

1. An acid-curable binder composition comprising

(a) a furfuryl alcohol prepolymer, and

(b) a dibasic acid diester of the composition

$$R^1O_2C(CH_2)_nCO_2R^2$$

wherein n is from 1 to 8, R^1 is a furfuryl group, and R^2 is a furfuryl group or a methyl group.

21. A sand core or mold comprising a shaped, filled body comprising an inorganic solid particulate material and a cured binder composition comprising an acid cured

(a) dibasic diester having the formula

$$R^1O_2C(CH_2)_nCO_2R^2$$

wherein n is from 1 to 8, R^1 is a furfuryl group and R^2 is a furfuryl or a methyl group, or

(b) mixture comprising said dibasic acid diester and a furfuryl alcohol prepolymer.

4,478,963

FILLER PARTICLES COATED WITH REACTIVE LIQUID POLYMERS IN A MATRIX RESIN

Frederick J. McGarry, Weston, Mass., assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 176,425, Aug. 8, 1980, abandoned. This application May 31, 1983, Ser. No. 499,618

Int. Cl.³ C08L *67/06*

U.S. Cl. 523—205 **19 Claims**

1. Composition of matter devoid of an ethylenically unsaturated acid or anhydride containing essential components consisting essentially of filler particles, a functionally-terminated elastomeric reactive liquid polymer as a thin film disposed on each of said filler particles, and a polymeric matrix in which said coated filler particles are embedded, said liquid polymer having Tg in the range of about 20° to −200° C. and number average molecular weight in the range of about 1,000 to 20,000.

4,478,964

POLYCARBONATE-SILICATE COMPOSITIONS

Russell P. Carter, Jr., New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 270,708, Jun. 5, 1981, abandoned. This application Dec. 29, 1981, Ser. No. 334,668

Int. Cl.³ C08L *69/00*

U.S. Cl. 523—216 **17 Claims**

1. A polycarbonate film comprising

(i) an aromatic thermoplastic polycarbonate resin, and

(ii) between 0.025 to 5 phr of a silicate having an average particle size of about 0.05 to about 20 microns, said silicate selected from the group consisting of hydrous alumino silicates, anhydrous alumino silicates, sillimanite minerals and wollastonite.

4,478,965

MELT PROCESSABLE PERFLUOROCARBON RESIN WITH DEGRADATION RETARDER

Thomas P. Concannon, Newtown Square, and Mitzie K. Rummel, Secane, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1982, Ser. No. 380,354
Int. Cl.³ C08K 3/10, 3/34; C08L 27/18
U.S. Cl. 523—218 15 Claims

1. A composition consisting essentially of perfluorocarbon resin and zeolite, said composition having a melt viscosity at temperatures below 380° C. of less than 10^6 poises.

4,478,966

CELLULOSIC BOARD

Göte Helgesson, Vallentuna; Björn Mansson, Sundsvall, and Nils-Hakan Wallin, Vällingby, all of Sweden, assignors to AB Casco, Stockholm, Sweden

Division of Ser. No. 29,845, Apr. 13, 1979, abandoned. This application Mar. 1, 1982, Ser. No. 353,088
Claims priority, application Sweden, Apr. 28, 1978, 7804942
Int. Cl.³ C08L 1/02
U.S. Cl. 524—13 7 Claims

1. A cellulosic board that is formed by the steps which include

(a) providing a cellulosic particulate material in the form of chips, sawdust or cutter shavings, such material having a moisture content below 6 percent by weight,

(b) mixing at least a part of the material from step (a) with a liquid that contains urea in a concentration adapted to avoid subsequent drying of the material, in an amount sufficient to give between 0.2 and 2 weight percent of the urea in the total cellulosic material, and allowing the urea to penetrate into and be retained in the particulate material,

(c) adding a urea-formaldehyde glue with a mole ratio of formaldehyde to urea within the range of 1.1:1 to 1.4:1, or such a glue modified with melamine, to the particulate cellulosic material after the urea has penetrated into the particulate cellulosic material,

(d) shaping the material resulting from step (c), having a moisture content below 14 percent by weight, into a desired form, and

(e) consolidating the shaped material by application of heat and pressure into a cellulosic board.

4. A cellulosic board that is formed by the steps which include

(a) providing a cellulosic particulate material in the form of chips, sawdust or cutter shavings, such material having a moisture content below 6 percent by weight,

(b) mixing at least a part of the material from step (a) with a water dispersion containing between 5 and 50 percent by weight of wax and 5 to 50 percent by weight of urea in a concentration adapted to avoid subsequent drying of the material, in an amount sufficient to give between 0.2 and 2 weight percent of the urea in the total cellulosic material and allowing the urea to penetrate into and be retained in the particulate material,

(c) adding a urea-formaldehyde glue with a mole ratio of formaldehyde to urea within the range of 1.1:1 to 1.4:1, or such a glue modified with melamine, to the particulate cellulosic material after the urea of step (b) has penetrated into the particulate cellulosic material,

(d) shaping the material resulting from step (c), having a moisture content below 14 percent by weight, into a desired form, and

(e) consolidating the shaped material by application of heat and pressure into a cellulosic board.

4,478,967

PHOTOLABILE BLOCKED SURFACTANTS AND COMPOSITIONS CONTAINING THE SAME

Gilbert L. Eian, White Bear Lake, and John E. Trend, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 11, 1980, Ser. No. 177,288
Int. Cl.³ C08K 5/42; C07C 143/02, 143/06
U.S. Cl. 524—86 20 Claims

1. A photolabile blocked surfactant compound having the general formula (P—X—$_a$R wherein

(—X)$_a$R is the hydrogen-eliminated residue of a surfactant having the formula (H—X—$_a$R wherein X is a polar divalent radical having the formula

P is a photolabile masking group which prior to exposure to actinic radiation masks the polar properties of X and upon exposure to actinic radiation will unmask the polar properties of X;

R is a hydrophobic group which provides in said surfactant (H—X—$_a$R a log (critical micelle concentration) equal to or less than −2; and

a is a number from 1 to 4 to satisfy the valency of R.

4,478,968

MANUFACTURE OF RESIN EXTENDED PIGMENTS

Edward E. Jaffe, Wilmington, Del., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 6, 1983, Ser. No. 482,596
Int. Cl.³ C08K 5/34, 5/56; C08J 3/20; C09C 3/10
U.S. Cl. 524—88 20 Claims

1. A process comprising converting a crude organic pigment into a highly aggregated pigment product of low crystallinity followed by milling the thus obtained product in the presence of from 10–75% by weight based on the amount of pigment of a water-insoluble thermoplastic resin, water having a pH of from 7–14 occupying essentially all of the voids below the level of the grinding elements in the mill and up to 25% by weight, based on pigment, of an organic liquid which does not exert solubilizing action on the resin and which is present as a separate phase from the water, in an amount which is effective in improving the crystallinity of the pigment particles.

4,478,969

POLYMER STABILIZATION

Jerry O. Reed, and Ronald D. Mathis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 377,213, May 11, 1982, abandoned. This application Jun. 22, 1983, Ser. No. 506,949
Int. Cl.³ C08K 5/34; C08G 75/14
U.S. Cl. 524—106 22 Claims

1. A resin composition exhibiting improved heat stability comprising a poly(arylene sulfide) resin containing an effective stabilizing amount sufficient to retard resin curing and crosslinking of at least one substituted amido triazole.

4,478,970

POLYPHENYLENE ETHER RESIN BLENDS REINFORCED WITH FINELY DIVIDED PARTICULATE CLAY OF NARROW SIZE DISTRIBUTION

Visvaldis Abolins, Delmar; Robert J. Axelrod, Glenmont, and Peter H. Shu, Schenectady, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1983, Ser. No. 564,479
Int. Cl.[3] C08K 5/53
U.S. Cl. 524—125 18 Claims

1. A plasticized thermoplastic composition, comprising
(a) a polyphenylene ether resin;
(b) an effective amount of a plasticizer; and
(c) a finely divided, particulate clay filler having the following characteristics:
(i) a mean equivalent spherical diameter of from 0.2 to 0.4 microns, and
(ii) 98 percent by weight or more are finer than 2 microns.

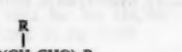
4,478,971

HIGH TEMPERATURE EXTRUDED POLYVINYL ALCOHOL MONOFILAMENT AND PROCESS FOR THE PREPARATION THEREOF

Larry Ballard, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed Jul. 8, 1983, Ser. No. 512,080
Int. Cl.[3] C08J 5/00; C08K 5/05; C08L 29/04
U.S. Cl. 524—376 24 Claims

1. A process for the high temperature extrusion of polyvinyl alcohol monofilament soluble in water comprising the steps of:
blending from about 80 to 98 percent by weight of a previously hydrolyzed polyvinyl alcohol resin having a number average molecular weight of from about 10,000 to 200,000 and a degree of hydrolysis of from about 85 to 96 percent with from about 20 to 2 percent by weight of a plasticizer selected from the group consisting of hydroxyethers having an average molecular weight of less than 325 and greater than 550 and having the formula



wherein R is hydrogen or methyl and R_1 is hydrogen, an alkyl group having from one to about 12 carbons and aromatic groups having from six to about 10 carbon atoms and n is an integer that will provide said average molecular weight, diols, triols and other polyols having from two to about 10 carbons and mixtures thereof;
reducing the moisture content of said resin to a level of less than about one percent and the volatile content thereof to a level of less than about two percent; and
extruding said blend to form monofilaments; wherein said monofilaments have a tenacity of from about 1.0 to 5.0 grams per denier and an elongation at break of from about five to 50 percent.

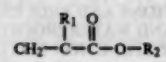
4,478,972

DIELECTRIC HEAT SEALED COATINGS

James A. Conrady, Amherst, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 503,468, Jun. 13, 1983,. This application Dec. 27, 1983, Ser. No. 565,312
Int. Cl.[3] C08K 5/05
U.S. Cl. 524—388 6 Claims

1. A dielectric heat sealable coating composition comprising a water dispersion of an acrylate polymer comprising less than 10 weight percent of an olefinically unsaturated carboxylic acid and greater than 60 weight percent of acrylate esters of the formula



wherein R_1 is hydrogen, methyl or ethyl, and R_2 is an alkyl group containing 1 to 30 carbon atoms copolymerized together, an ammonium salt and glycerine.

4,478,973

RUBBER COMPOSITION CONTAINING FURNACE CARBON BLACK

Shinji Misono, and Hiroaki Suzuki, both of Aichi, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,647
Claims priority, application Japan, Jan. 31, 1983, 58-12888
Int. Cl.[3] C08K 3/04
U.S. Cl. 524—496 4 Claims

1. A rubber composition which comprises 100 parts by weight of basic rubber and 25 to 250 parts by weight of furnace carbon black having the particle properties defined by an N_2SA higher than 60 m^2/g and a DBP higher than 108 ml/100 g and the following selective characteristic values,
True specific gravity $\geqq -0.0006 \times N_2SA + 1.8379$
Tinting strength (%) $\geqq 0.6979 \times N_2SA - 0.4278 \times DBP + 203.3$
Range of aggregate size distribution (ΔDst) $\geqq 0.6118 \times$ (Dst mode diameter) + 30.6.

4,478,974

HETEROGENEOUS POLYMER LATEX OF RELATIVELY HARD AND RELATIVELY SOFT INTERPOLYMERS OF A MONOVINYLIDENE AROMATIC MONOMER AND AN ALIPHATIC CONJUGATED DIENE MONOMER

Do I. Klee, Midland, Mich., and Traute Mundorf, Milan, Italy, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 152,264, May 21, 1980, abandoned. This application Aug. 4, 1983, Ser. No. 520,047
Int. Cl.[3] C08F 279/02
U.S. Cl. 524—533 17 Claims

1. An aqueous synthetic polymer latex, the dispersed polymer particles of which are heterogeneous and individually comprise per 100 parts by weight of the polymer particle:
(a) from about 20 to about 45 parts by weight of a relatively soft interpolymer domain having a glass transition temperature less than about 25° C. and comprising in polymerized form and based upon the total soft interpolymer:
(1) from about 25 to about 65 weight percent of a monovinylidene aromatic monomer; and
(2) from about 35 to about 75 weight percent of an open chain aliphatic conjugated diene monomer; and
(b) from about 55 to about 80 parts by weight of a relatively hard interpolymeric domain having a glass transition temperature greater than 25° C. and comprising, in polymerized form and based upon the total hard interpolymer portion:
(1) from about 70 to about 90 weight percent of a monovinylidene aromatic monomer;
(2) from about 10 to about 30 weight percent of an open chain aliphatic conjugated diene monomer; and
(3) from about 0.5 to about 11 weight percent of a functional compound selected from the class consisting of addition polymerizable carboxylic acids, hydroxyalkyl acrylates, and hydroxyalkyl methacrylates.

4,478,975

COMPOSITIONS AND PROCESS FOR THE OILPROOFING AND WATERPROOFING TREATMENT OF CONSTRUCTION MATERIALS

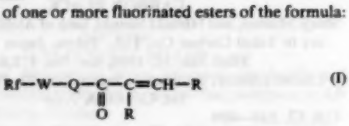
André L. Dessaint, Clermont, and Marie-José Lina, Nogent-sur-Oise, both of France, assignors to Atochem, Courbevoie, France

Filed Jan. 19, 1984, Ser. No. 572,026
Claims priority, application France, Jan. 28, 1983, 83 01346
Int. Cl.³ C08G 18/46
U.S. Cl. 524—871 11 Claims

1. A composition for the treatment of construction materials which comprises, by weight:

(A) from 0.1 to 25% of at least one fluorinated copolymer formed from:

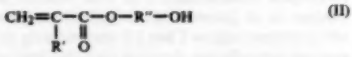
(1) 5 to 70% of one or more fluorinated esters of the formula:



(I)

in which Rf represents perfluoro alkyl with straight or branched chain containing 2 to 20 carbon atoms, Q represents oxygen or sulfur, W represents a bivalent bond connected to Q by carbon and capable of containing one or more atoms of a member selected from oxygen, sulfur, nitrogen and mixtures thereof, one of the symbols R represents hydrogen and the other symbol R represents hydrogen or alkyl containing 1 to 4 carbon atoms:

(2) 4 to 50% of one or more monomers of the formula:



(II)

in which R′ represents hydrogen or alkyl containing 1 to 4 carbon atoms and R″ represents alkylene containing 2 to 4 carbon atoms, and

(3) 0 to 91% of one or more unsaturated monomers other than and copolymerizable with the monomers of formulas (I) and (II);

(B) from 2 to 25% of at least one polyisocyanate or isocyanate prepolymer which may be aliphatic or aromatic;

(C) from 0.1 to 10% of at least one catalyst; and

(D) one or more diluting solvents to make up to 100%, the content of non-volatiles in the composition not exceeding 30%.

4,478,976

WATER-INSOLUBLE PROTEIN MATERIAL, ITS PREPARATION AND ITS USE

Hans-Helmut Goertz; Stefan Marcinowski, both of Ludwigshafen, and Axel Sanner, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,317
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138194
Int. Cl.³ C08J 9/00
U.S. Cl. 525—54.1 5 Claims

1. A water-insoluble protein material consisting essentially of a biologically active protein on a water-insoluble carrier, wherein the protein is adsorbed onto a water-insoluble copolymer based on 30 to 99 percent, by weight of the copolymer, of N-vinylimidazole or substituted N-vinylimidazoles, 1 to 70 percent by weight of a copolymerizable, polyolefinically unsaturated monomer and 0 to 69 percent by weight of monomers which are copolymerizable therewith.

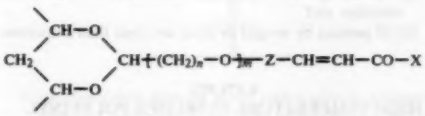
4,478,977

PHOTOPOLYMER DERIVATIVES OF POLYVINYL ALCOHOL

John A. Sperry, Abingdon, and Dennis D. Maguire, Reading, both of England, assignors to Autotype International Limited, Wantage, England

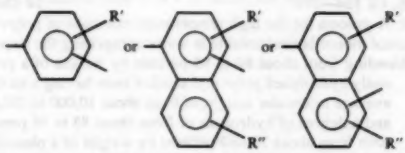
Filed Mar. 15, 1983, Ser. No. 475,637
Claims priority, application United Kingdom, Apr. 23, 1982, 8211788
Int. Cl.³ G03C 1/68
U.S. Cl. 525—61 11 Claims

1. A photopolymer, characterized by comprising a polyvinyl alcohol derivative which incorporates a constituent of the formula:



(I)

wherein m is 0 or 1, n is an integer from 1 to 6, X is an aromatic or heterocyclic group carrying at least one polar group and Z is an aromatic group of the formula:



wherein R′ and R″, when both are present, are the same or different and each represents a hydrogen or a halogen atom or an alkyl, alkoxy, hydroxyalkyl, hydroxy, nitro or cyano group.

4,478,978

TOUGHENED POLYAMIDE BLENDS

Miguel J. Roura, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 198,356, Oct. 20, 1980, Pat. No. 4,346,194, which is a continuation-in-part of Ser. No. 114,240, Jan. 22, 1980, abandoned. This application Aug. 13, 1982, Ser. No. 407,822
Int. Cl.³ C08L 77/00; C08F 8/30
U.S. Cl. 525—66 3 Claims

1. A thermoplastic polyamide blend comprising:

(a) 60–97% by weight of a thermoplastic polyamide which is a mixture of 20–80% by weight 66 nylon and complementally 80–20% by weight 6 nylon, and complementally

(b) 3–40% by weight of a polymeric, toughening agent that is an ionic copolymer of at least one α-olefin and at least one α,β-unsaturated carboxylic acid which can contain a third copolymerizable monomer, in which the acid moiety is at least partially ionized by neutralizing with metal basic salts.

4,478,979

COMPOSITION COMPRISING COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN UNSATURATED CYCLIC ANHYDRIDE AND IMPACT IMPROVERS

Visvaldis Abolins, Delmar; John C. Goossens, Mount Vernon; Fred F. Holub, Schenectady, and Gim F. Lee, Jr., Albany, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 333,984, Dec. 23, 1981, Pat. No. 4,404,321, which is a division of Ser. No. 163,422, Jun. 27, 1980, abandoned, which is a division of Ser. No. 839,905, Oct. 6, 1977, Pat. No. 4,234,701. This application Jun. 24, 1983, Ser. No. 507,583

Int. Cl.³ C08L *61/04*

U.S. Cl. 525—68 11 Claims

1. A thermoplastic molding composition which comprises an intimate admixture of:

(a) a rubber-modified copolymer of a vinyl aromatic compound and an α, β-unsaturated cyclic anhydride;

(b) an impact modifier consisting essentially of a segmented copolyester having a multiplicity of recurring intralinear etherester and ester units;

(c) a polyphenylene ether resin; and

(d) an effective ductile impact strength improving amount of a low molecular weight normally liquid polybutadiene oligomer.

4,478,980

BLENDS OF HIGHER ALPHA-OLEFIN POLYMERS AND 1,2-EPOXIDE POLYMERS

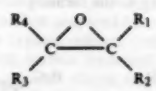
Joginder Lal, Akron, and Paul H. Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 13, 1982, Ser. No. 416,794

Int. Cl.³ C08L *23/20, 71/00*

U.S. Cl. 525—187 10 Claims

1. A rubbery composition comprising a blend of between 95/5 and 5/95 weight percent of (1) a rubbery interpolymer consisting of (a) at least 80 weight percent of at least one α-olefin containing from 5 to 10 carbon atoms and (b) at least one nonconjugated polyene containing from 5 to 30 carbon atoms with (2) an unsaturated polymer of an α-olefin oxide prepared from 80 to 99.5 weight percent of at least one monomer having the structure:



(I)

wherein R_1 and R_2 are selected from the group consisting of hydrogen or a lower alkyl radical containing from 1 to 8 carbon atoms and R_3 and R_4 are selected from the group consisting of hydrogen, a lower alkyl radical containing from 1 to 8 carbon atoms and an alkoxyalkyl radical containing up to 12 carbon atoms, an aryl radical, a haloalkyl radical containing from 1 to 12 carbon atoms and in which R_3 and R_4 taken together may be trimethylene, tetramethylene, or hexamethylene, thereby forming a cyclic epoxide; with from 0.5 to 20 weight percent of a comonomer selected from the group consisting of butadiene monoxide, isoprene monoxide, 1,2-epoxy-3-allyloxypropane (allyl glycidyl ether), 4,5-epoxy-1-hexene, 4,5-epoxy-2-hexene, 1,5-cyclooctadiene monoepoxide, 1-vinyl-3,4-epoxycyclohexane and limonene monoxide.

4,478,981

MIXTURES OF POLYACRYLATE RESINS AND SILOXANE CARBONATE COPOLYMERS

Barry C. Arkles, Oreland, Pa., assignor to Petrarch Systems Inc., Levittown, Pa.

Filed Mar. 22, 1982, Ser. No. 360,525

Int. Cl.³ C08L *33/08, 33/10, 33/12, 69/00*

U.S. Cl. 525—92 11 Claims

1. A composition comprising an oxygen-permeable, transparent alloy of a polyacrylic resin and a siloxane-carbonate copolymer comprising an organo polysiloxane-bisphenol A carbonate block copolymer.

4,478,982

HIGH NITRILE CONTENT BASED RESIN AND METHOD OF PRODUCING THE SAME

Shoichi Matsumura; Yoshihiko Hashimoto; Hiroyasu Furukawa, and Masaaki Azuma, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 108,471, Dec. 31, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 302,182

Claims priority, application Japan, Dec. 30, 1978, 53-165055

Int. Cl.³ C08F *279/04*

U.S. Cl. 525—316 13 Claims

1. High nitrile content resin produced by graft polymerizing in two consecutive and separate steps, comprising in a first emulsion polymerization step,

(B) 5 to 40 parts by weight of a monomer mixture consisting essentially of

30 to 60% by weight of unsaturated nitrile, and

70 to 40% by weight of other vinyl compound or compounds containing aromatic vinyl compound as an essential element, is substantially completely polymerized in the presence of

(A) 5 to 25 parts by weight of rubber in latex containing at least 50% by weight of a component to which 1,3-conjugated diene is polymerized; and in a second consecutive emulsion polymerization step,

(C) 35 to 90 parts by weight of a monomer mixture consisting essentially of

65 to 85% by weight of unsaturated nitrile, and

40 to 15% by weight of other vinyl compound mixture containing aromatic vinyl compound and alkyl methacrylate and/or alkyl acrylate, is substantially completely polymerized onto the graft copolymer obtained in the said first step.

4,478,983

POLYMER BOUND ARYL SUBSTITUTED CROWN ETHERS

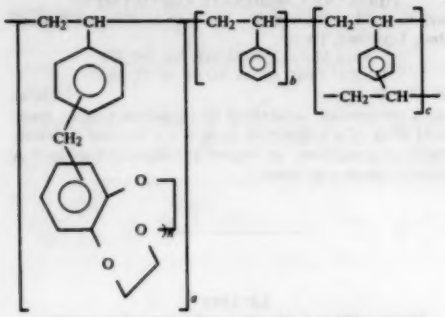
Dane K. Parker, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 354,563, Mar. 4, 1982,. This application Nov. 30, 1983, Ser. No. 556,486

Int. Cl.³ C08F *8/00*

U.S. Cl. 525—332.2 1 Claim

1. In a chemical reaction process selected from the group consisting of phase transfer oxidations, nucleophilic displacements, reductions, carbene generation, condensations, alkylations and eliminations; wherein a phase transfer catalyst is utilized, the improvement comprising the use of a phase transfer catalyst of the following structural formula:



(I)

wherein n is 3 or 4 and the ratio of a to b to c may vary from 1:98:1 to 50:49:1 to 1:49:50.

4,478,984

SYNTHESIS OF BENZHYDRYLAMINE RESINS

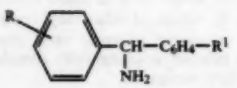
William M. Bryan, West Chester, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Sep. 23, 1983, Ser. No. 535,184

Int. Cl.³ C08F *32/06*

U.S. Cl. 525—333.6 **3 Claims**

1. The method of preparing a BHA resin compound of the formula:

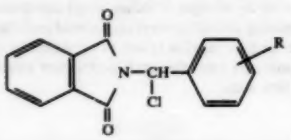


in which:

R_1 is hydrogen, methyl, methoxy or nitro; and

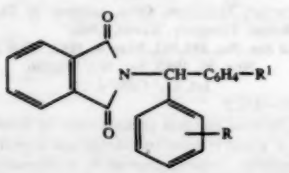
R^1, taken with the C_6H_4 to which it is attached, is a polystyrene,

comprising reacting a compound of the formula:



in which:

R is as defined above, with a polystyrene containing resin in the presence of a Lewis acid to give a PB resin compound of the formula:



in which R and R^1 are as defined above, and, reacting said PB resin compound with hydrazine.

4,478,985

PROCESS FOR THE PREPARATION OF RESINOUS COMPOUNDS, COMPOUNDS PRODUCED THEREBY AND THEIR USE IN THERMOSETTING COATING COMPOSITIONS

Jurrianus Bekooij; Werner T. Raudenbusch; Stephen A. Stachowiak; Petrus G. Kooijmans, and Henricus P. H. Scholten, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1983, Ser. No. 560,467

Claims priority, application United Kingdom, Dec. 22, 1982, 8236477

Int. Cl.³ C09D *3/52, 3/58, 5/40*

U.S. Cl. 525—530 **9 Claims**

1. A process for the preparation of carboxyl-containing resinous compounds, suitable for making water-dilutable thermosetting coating compositions after at least partial neutralization with a base, wherein a non-acidic hydroxyl-containing resinous intermediate is reacted with a polycarboxylic acid anhydride at a temperature not higher than 150° C., characterized in that a resinous intermediate, prepared by reacting at a temperature in the range 120° to 180° C. in the presence of an esterification catalyst in one or more steps (a) a diglycidyl ether of a dihydric phenol having a weight per epoxy (WPE) not exceeding 1100 with (b) a monofunctional phenol, and (c) dimerized unsaturated fatty acids in an epoxy, phenolic or acidic equivalent ratio of (a), (b) and (c) from $x/2/(x-2)$ to $(x+0.1x)/2/(x-2)$, wherein x is at least 4 for a diglycidyl ether having a WPE from 400 to 1100 and x is at least 6 for a diglycidyl ether having a WPE from below 400, is reacted with a polycarboxylic acid anhydride in an amount to produce a half-ester having an acid value from about 5 to 80 mg KOH/g.

4,478,986

TRI-N-SUBSTITUTED-S-TRIAZINE-TRIONE CHAIN TERMINATOR FOR POLYVINYL CHLORIDE POLYMERIZATION

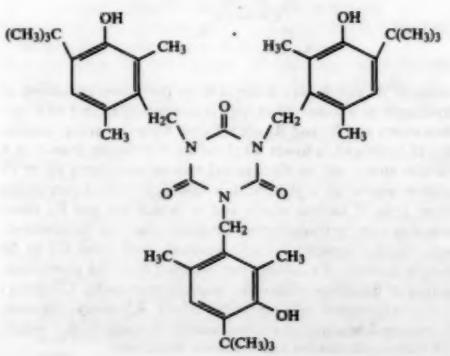
William J. Reid, New Fairfield, Conn., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 280,389, Jul. 6, 1981, abandoned. This application Sep. 16, 1982, Ser. No. 418,514

Int. Cl.³ C08F *2/38, 2/42*

U.S. Cl. 526—83 **5 Claims**

1. In the process for the suspension polymerization of vinyl chloride monomer which comprises adding the monomer to an aqueous reaction system containing effective amounts of a suspending agent and a polymerization initiator, terminating the polymerization reaction and isolating the polyvinyl chloride, the improvement which comprises terminating the polymerization reaction by the addition to the reaction system at a point within the range of 70 to 95% monomer conversion of 25–5000 ppm, by weight of a vinyl chloride monomer, of a compound corresponding to the formula



4,478,987

ALUMINA-BASED AEROGEL SUPPORTED TRANSITION METAL CATALYST USEFUL AS A ZIEGLER-NATTA OLEFIN POLYMERIZATION CATALYST AND PROCESS FOR PREPARING SAME

Anthony J. Fanelli, Rockaway, and Alson K. Price, Chester, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 24, 1982, Ser. No. 422,928
Int. Cl.³ C08F 4/02, 10/02
U.S. Cl. 526—97 16 Claims

1. A process for the polymerization and copolymerization of alpha-olefins which comprises contacting an alpha-olefin at a temperature and at a pressure sufficient to initiate the polymerization and copolymerization with a catalytic amount of

(a) a di(C_1–C_{18} alkyl) chloroaluminum compound or a tri(C_1–C_{18}alkyl) aluminum compound; and

(b) a catalyst produced by the reaction of a transition metal compound formed from members selected from the group consisting of titanium, vanadium, hafnium, and zirconium and from members selected from the group consisting of chlorides, oxychlorides, alkoxychlorides and oxyalkoxychlorides with a heat-activated alumina based aerogel having a morphology by transmission electron microscopy comprising thin film-like structures and having a bulk density less than about 0.10 g/cm^3, a BET surface area greater than about 300 m^2/g and a pore volume greater than about 3 cm^3/g and obtained by heating an alumina-based aerogel having a carbon content at a temperature of at least about 400° C., in the presence of oxygen, for a time sufficient to produce said heat activated alumina-based aerogel substantially free of carbon; said alumina-based aerogel being prepared by venting a C_1–C_5 alcohol or mixture of same, under supercritical conditions, from a mixture comprising a hydrolyzable aluminum compound, water, and a C_1–C_5 alcohol.

4,478,988

POLYMERIZATION METHOD

Thomas J. Pullukat, Hoffman Estates, and Raymond E. Hoff, Palatine, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 287,950, Jul. 29, 1981, Pat. No. 3,374,753. This application May 24, 1982, Ser. No. 381,730
Int. Cl.³ C08F 4/02, 10/02
U.S. Cl. 526—128 21 Claims

1. The method of making polymers and copolymers of ethylene which comprises polymerizing ethylene, or ethylene and at least one 1-olefin under polymerizing conditions with a catalyst system comprising an alkyl or aryl aluminum compound cocatalyst and a catalyst prepared by:

(1) reacting an organic silicon compound with silica or alumina having surface hydroxyl groups or a mixture thereof, said organic silicon compound being reactive with said surface hydroxyl groups and selected from the group consisting of N, O-bis-(trimethylsilyl) acetamide and compounds of the formulae $(R_3Si)_2NH$ and R_nSiX_m wherein m and n are 1, 2 or 3, m+n=4, X is a group which is chemically reactive with said surface hydroxyl groups selected from the group consisting of —OCH_3, —OCH_2CH_3, —NH_2, —$N(CH_3)_2$, —$OCH_2CH_2OCH_3$ and —O_2CCH_3, and R is a hydrocarbon group consisting solely of carbon and hydrogen;

(2) reacting in the presence of a solvent the product of (1) with an organomagnesium compound or complex;

(3) reacting the product of (2) with an alcohol of the formula R'OH wherein R' is an alkyl or benzyl group consisting solely of carbon and hydrogen, the amount of said alcohol being selected to result in an alcohol/magnesium molar ratio of about 0.1 to about 5; or, alternatively,

(2') reacting in the presence of a solvent the product of (1) with the alcohol of (3); and,

(3') reacting the product of (2') with an organomagnesium compound or complex; and

(4) reacting the product of (3) or (3') with a halide or alkoxide of titanium, vanadium, zirconium or mixtures thereof.

4,478,989

PROCESS FOR THE STEREOSPECIFIC POLYMERIZATION OF AN ALPHA OLEFIN AND AN ALPHA OLEFIN POLYMERIZATION CATALYST SYSTEM

Brian L. Goodall, Houston, Tex., and Wilhelmina J. M. van der Linden-Lemmers, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 348,400, Feb. 12, 1982, abandoned, which is a continuation of Ser. No. 158,082, Jun. 10, 1980, abandoned. This application Oct. 26, 1983, Ser. No. 545,574
Claims priority, application United Kingdom, Jun. 11, 1979, 7920181
Int. Cl.³ C08F 4/64, 10/06
U.S. Cl. 526—142 8 Claims

1. An olefin polymerization catalyst system comprising a solid component (a) and a separate and independent cocatalyst (b,i) or (b,ii) wherein component (a) is a catalytically active titanium trihalide; component (b,i) is a reaction product of at least one organoaluminum halide and at least one aromatic compound, and component (b,ii) is a reaction product of at least one organoaluminum halide, at least one aromatic compound and at least one halogen-free organoaluminum compound, wherein

(1) the aromatic compound is selected from the group consisting of 2,6-di-tert.butyl-hydroxy benzene, 2,6-di-tert.butyl-4-methyl-hydroxy benzene, 2,6-di-tert.decyl-4-methoxy-hydroxy benzene, 2,6-di-tert.butyl-4-isopropyl hydroxy benzene, tri-(2,6-di-tert.hexyl-hydroxy-phenyl) benzene, 1,3,5 tris-(2,6di-tert.butyl-hydroxy-phenyl)-2,4,6-trimethyl benzene, 2,2-di-(2,6-di-tert.butyl-hydroxy-phenyl) propane, di-(2,6-di-tert.butyl-hydroxy-phenyl) methane, 2,6-di-tert.amyl-4-n-butyl-hydroxy benzene, 1,3-di-tert.butyl-2-hydroxy anthracene, 1,3-di-tert.hexyl-2-hydroxy phenanthrene, 1,3,6,8-tetra-tert.butyl-2,7-dihydroxy phenanthrene, 2,8-di-tert.butyl-hydroxy naphtalene, 1,3-di-tert.hexyl-2-hydroxy naphtalene, 2,6-dicyclohexyl-4-methyl-hydroxy benzene, 2,6-di-isopropyl-4-methoxy-hydroxy benzene, and 1,3-di-isoamyl-2-hydroxy naphtalene;

(2) the organoaluminum halide is an alkylaluminum mono- or dihalide;

(3) the halogen-free organoaluminum compound is an alkylaluminum compound;

(4) the molar ratio of aluminum to aromatic compound in the preparation of component (b,i) or (b,ii) is in the range from 0.5:1 to 3:1;

(5) said reaction products (b,i) and (b,ii) contain at least one carbon-aluminum bond; and

(6) the ratio of component (b,i) or (b,ii) to component (a) is in the range from 0.1:1 to 12:1.

4,478,990

ROOM TEMPERATURE CURING ELASTIC COMPOSITION

Kiyoshi Kohno, Takatsuki; Satoshi Nishikawa, Shiga; Yoshiya Hattori, Takatsuki, and Kohji Kitao, Sakai, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

Filed Apr. 26, 1982, Ser. No. 371,989
Claims priority, application Japan, Apr. 28, 1981, 56-64740
Int. Cl.³ C08F 20/12, 30/08
U.S. Cl. 526—279 1 Claim

1. A room temperature curing elastic sealant composition

which comprises as a main component a liquid polymer produced by the free-radical polymerization of

(a) one mole of at least one acrylic ester monomer of the formula:

$$CH_2{=}CHCOOR_1 \qquad [I]$$

wherein R_1 is alkyl having 2 to 8 carbon atoms; with

(b) at least one member selected from the group consisting of a vinylalkoxysilane of the formula:

$$CH_2{=}CH{-}\overset{\displaystyle (R_2)_a}{\overset{|}{Si}}{-}(X)_{3-a} \qquad [II]$$

wherein R_2 is methyl, X is methoxy or ethoxy, and a is 0 or 1, and a methacryloxyalkoxysilane of the formula:

$$CH_2{=}\overset{\displaystyle R_3}{\overset{|}{C}}{-}COOR_4{-}\overset{\displaystyle (R_5)_b}{\overset{|}{Si}}{-}(Y)_{3-b} \qquad [II']$$

wherein R_3 is hydrogen or methyl, R_4 is ethylene or propylene, R_5 is methyl, Y is methoxy or ethoxy, and b is 0 or 1, in the presence of

(c) 0.002 to 0.03 mole of a chain transfer agent having a mercapto group selected from the group consisting of n-butyl mercaptan, octyl mercaptan, lauryl mercaptan, benzyl mercaptan, cyclohexyl mercaptan and a mercaptoalkoxysilane of the formula:

$$HS{-}R_6{-}\overset{\displaystyle (R_7)_c}{\overset{|}{Si}}{-}(z)_{3-c} \qquad [III]$$

wherein R_6 is ethylene or propylene, R_7 is methyl, z is methoxy or ethoxy, and c is 0 or 1;

said component (b) being used in an amount of 0.5 to 2.0 moles per mole of component (c) when component (c) is a mercaptalkoxysilane of the formula [III], or in an amount of 1.5 to 3.0 moles per mole of component (c) when component (c) is a mercaptan compound other than the mercaptoalkoxysilane of the formula [III];

said liquid polymer having an average molecular weight of 3,000 to 100,000 and containing 1.5 to 3 alkoxysilyl groups per molecule of polymer.

4,478,991

SULFONIC ACID COPOLYMER ELECTROLYTE

Sun Yi. Huang, Stamford, Conn., and Robert D. Giglia, Rye, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 199,892, Oct. 23, 1980, Pat. No. 4,361,385. This application Apr. 14, 1982, Ser. No. 368,260

Int. Cl.³ C08F *28/02*

U.S. Cl. 526—287 **2 Claims**

1. A water-soluble, transparent-film-forming copolymer of 2-acrylamido-2-methylpropane sulfonic acid (AMPS) and vinyl sulfonic acid (VSA) wherein the proportion of AMPS units to VSA units in the copolymer is in the range from 3:2 to 2:3.

4,478,992

POLYMERIZABLE VINYL BENZOATES

Paul D. Yacobucci, and John C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 329,548, Dec. 10, 1981, Pat. No. 4,420,630. This application Sep. 9, 1983, Ser. No. 530,813

Int. Cl.³ C08L *33/14*; C08F *20/38*

U.S. Cl. 526—288 **3 Claims**

1. A polymer comprising:

(a) about 1 to 100 mole percent of one or more units having the formula:

$$\left(CHR{-}\overset{\displaystyle Ar}{\overset{|}{C}}{-}O{-}Ar'{-}X\right)$$
$$\qquad\qquad\qquad

4,478,995

COMPLEX COMPOUNDS

Masamitu Shinoda, Minou; Ikuo Tanaka, Minou; Tadahiko Yasuda, Kyoto; Isao Nakajima, Toyonaka; Tutomu Adachi, Itami, and Giichi Ikeda, Kyoto, all of Japan, assignors to Teikoku Chemical Industry Co., Ltd., Osaka, Japan

Filed Aug. 27, 1982, Ser. No. 412,972

Claims priority, application Japan, Sep. 1, 1981, 56/138048

Int. Cl.³ C08B 37/16

U.S. Cl. 536—46 8 Claims

1. A complex of an acid addition salt of (2'-benzyloxycarbonyl)phenyl trans-4-guanidinomethylcyclohexanecarboxylate with a cyclodextrin.

4,478,996

PROCESS FOR THE PREPARATION OF 4-HYDROXY-2-METHYL-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE-1,1-DIOXIDES

Manuel A. Almenara, Barcelona, Spain, assignor to Medichem, S.A., Barcelona, Spain

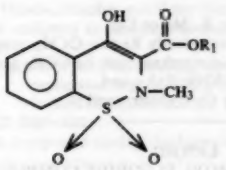
Filed Mar. 7, 1983, Ser. No. 472,831

Claims priority, application Spain, Apr. 16, 1982, 511.472; Jan. 11, 1983, 518.908; Jan. 11, 1983, 518.909

Int. Cl.³ C07D 401/12, 279/02

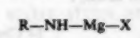
U.S. Cl. 544—49 4 Claims

1. A process for the preparation of 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxides wherein an alkyl 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylate 1,1-dioxide of formula



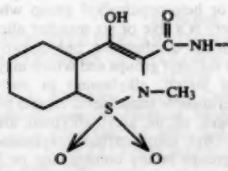
(III)

in which R_1 is a C_1–C_6 alkyl, is reacted with a magnesium derivative of formula:



(IV)

in which X is halogen, and R may be phenyl, aryl substituted with halogen (Cl, Br or I) or with C_1–C_6 alkyl groups, 2, 3 or 4 pyridyl or pyridyls substituted with halogen (Cl, Br or I) or with C_1–C_6 alkyl groups, 5-methyl-isoxazolyl or 2-thiazolyl, the reaction being carried out in a solvent inert to the reaction at temperature between 0° and 130° C., until the reaction is almost complete, after which the intermediate is hydrolysed in an acid medium and the product obtained, of the formula:



(I)

in which R is as defined hereinbefore, is recrystallised.

4,478,997

1-OXADETHIACEPHAM COMPOUNDS

Mitsuru Yoshioka; Shoichiro Uyeo, both of Toyonaka; Yoshio Hamashima, Kyoto; Ikuo Kikkawa, Takarazuka; Teruji Tsuji, Takatsuki, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

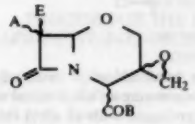
Division of Ser. No. 374,862, May 4, 1982, Pat. No. 4,443,598, which is a continuation-in-part of Ser. No. 322,662, Nov. 18, 1981, Pat. No. 4,366,316, which is a continuation of Ser. No. 72,600, Sep. 5, 1979, abandoned, which is a continuation of Ser. No. 877,811, Feb. 14, 1978, abandoned. This application Oct. 19, 1983, Ser. No. 543,664

Claims priority, application Japan, Feb. 15, 1977, 52-15813; Jun. 6, 1977, 52-67025; Oct. 1, 1980, 55-138092

Int. Cl.³ C07D 498/04

U.S. Cl. 544—71 4 Claims

1. A compound of the following formula:



wherein

A is amino or substituted amino,

E is δ-hydrogen or α-methoxy, and

COB is carboxy or protected carboxy.

4,478,998

PROCESS FOR PREPARING AMINE SALTS OF PHOSPHORIC ACIDS

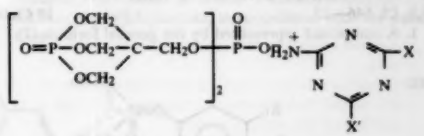
Yuval Halpern, Skokie; Donna M. Mott, Des Plaines, both of Ill., and Ron H. Niswander, Lake Jackson, Tex., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed May 23, 1983, Ser. No. 497,354

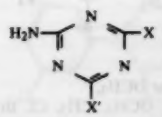
Int. Cl.³ C07D 251/70, 251/46; C07F 9/65, 9/15

U.S. Cl. 544—195 7 Claims

1. A process for the preparation of an amino-s-triazine salt of a phosphoric acid having the structure



where X and X' are the same or different hydroxy or amine groups comprising reacting the acid chloride of bis-(pentaerythritol phosphate) phosphoric acid with an amino-s-triazine of the structure



in the presence of water.

4,478,999

PROCESS FOR THE PREPARATION OF PHENYLPYRIDAZINE COMPOUNDS

Franz Raninger, St. Florian, Austria, assignor to Chemie Linz Aktiengesellschaft, Linz, Austria

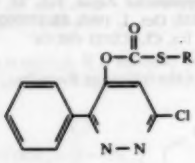
Filed Apr. 13, 1983, Ser. No. 484,553

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218976

Int. Cl.³ C07D *237/12*; A01N *43/58*

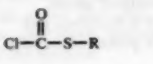
U.S. Cl. 544—241 **4 Claims**

1. A process for preparing a phenylpyridazine compound of the formula



(I)

wherein R is straight-chain or branched alkyl having 2 to 8 carbon atoms, which comprises reacting an alkali metal salt of 3-phenyl-4-hydroxy-6-chloropyridazine with an alkyl thioformate of the formula



(II)

wherein R is as defined above, in a water/acetone solution containing 50 to 75% by weight of acetone and 25 to 50% by weight of water, at a temperature from 5° to 60° C., separating off the resultant aqueous phase, which contains alkali metal chloride and which has a higher specific gravity than the resultant organic phase, and recovering a substantially pure phenylpyridazine compound of the formula I by evaporating the acetone from the organic phase.

4,479,000

CERTAIN ACRIDINYL-PHOSPHORAMIDATE COMPOUNDS

Gordon W. Rewcastle; Graham J. Atwell; Bruce C. Baguley, and William A. Denny, all of Auckland, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

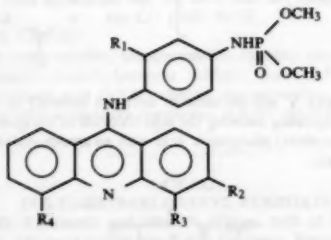
Filed Aug. 19, 1982, Ser. No. 409,594

Claims priority, application New Zealand, Aug. 21, 1981, 198115

Int. Cl.³ C07D *487/00*; A01N *43/42*

U.S. Cl. 546—23 **18 Claims**

1. A compound represented by the general formula (I):



I

in which

R_1 represents H or OCH_3,

R_2 represents H, OCH_3, CH_3, Cl, Br, I, $NHCOCH_3$ or $NHCOOCH_3$,

R_3 represents H, CH_3 or OCH_3 and

R_4 represents H,

or a pharmaceutically acceptable acid addition salt thereof.

4,479,001

TRIFLUOROMETHYL PYRIDINYLTHIOPHENOXY PROPANOIC ACIDS AND PROPANOLS AND DERIVATIVES THEREOF

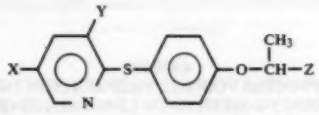
Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 357,346, Mar. 11, 1982, abandoned, which is a continuation of Ser. No. 918,550, Jun. 23, 1978, , which is a continuation-in-part of Ser. No. 817,943, Jul. 22, 1977, abandoned. This application Feb. 17, 1983, Ser. No. 467,552

Int. Cl.³ C07D *213/70*

U.S. Cl. 546—291 **5 Claims**

1. A compound of the formula

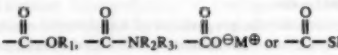


wherein:

X is Cl, Br or CF_3;

Y is H, Cl, Br or CF_3, provided at least one of X and Y is CF_3;

Z is



R_1 is H, C_1–C_8 alkyl, benzyl, chlorobenzyl or C_3–C_6 alkoxyalkyl;

R_4 is C_1–C_4 alkyl;

M is $—NHR_2R_3R_7$, Na, K, Mg or Ca;

R_2 and R_3 are each independently R_7 or $—OCH_3$, provided both R_2 and R_3 cannot simultaneously be OCH_3 and neither is $—OCH_3$ in $—NHR_2R_3R_7$; and

R_7 is H, C_1–C_4 alkyl or C_2–C_3 hydroxyalkyl.

4,479,002

CARBAMATE-CARBAMOYL FLUORIDE COMPOUNDS

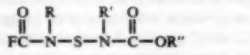
Wei C. Liang, So. Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 1, 1975, Ser. No. 636,371

Int. Cl.³ C07C *161/00*; C07D *213/56, 307/54, 333/24*

U.S. Cl. 546—335 **14 Claims**

1. A compound of the formula:



wherein:

R and R′ are the same or different and are alkyl groups having from one to four carbon atoms,

R″ is a substituted or unsubstituted alkyl, cycloalkyl, phenylalkyl, naphthylalkyl or heterocycloalkyl group wherein the heterocyclic moiety is a five or six member alicyclic ring which includes in any combination, one or two oxygen, sulfur, sulfinyl or sulfonyl groups and which may also include one divalent amino, alkylamino or carbonyl group; wherein the permissible substituents on said groups are one or more halogen, nitrile, alkyl, alkylthio, alkoxy, alkylsulfinyl, alkylsulfonyl, alkoxycarbonyloxylamino, or alkylcarbonylamino groups in any combination or R″ is alkoxyalkyleneoxyalkyl, alkoxy(dialkyleneoxy)alkyl or alkoxy(trialkyleneoxy)alkyl; with the proviso that except

where R'' is alkyl, no single alkyl or alkylene moiety in any R'' group may include more than six carbon atoms.

4,479,003
HETEROCYCLIC-HYDROXY-SUBSTITUTED CARBOXYLATE ESTERS

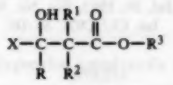
Yoram Houminer, Richmond, and Harvey J. Grubbs, Mechanicsville, both of Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Division of Ser. No. 122,901, Feb. 20, 1980,. This application May 20, 1981, Ser. No. 265,635

Int. Cl.³ A24B *3/40, 3/38, 3/36, 3/12*

U.S. Cl. 546—341 **5 Claims**

1. A heterocyclic-hydroxy-substituted carboxylate composition corresponding to the formula:



wherein X is a heterocyclic substituent containing between about 2–12 carbon atoms, and any heteroatom in X is selected from oxygen, nitrogen and sulfur; R is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms; R^1 and R^2 are hydrogen or substituents selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms, and R^1 and R^2 when taken together with connecting elements form an alicyclic structure; and R^3 is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms.

4,479,004
1-[2-(4-DIPHENYL)-1,3-DIOXOLAN-2-YL-METHYL]-1-H-TRIAZOLES

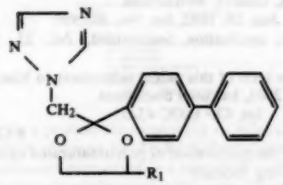
Adolf Hubele, Magden, and Peter Riebli, Basel, both of Switzerland, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 203,002, Nov. 3, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 423,391

Int. Cl.³ C07D *405/06;* **A01N** *43/64*

U.S. Cl. 548—101 **4 Claims**

1. A compound having the formula



wherein R_1 represents hydrogen or a C_1–C_3 alkyl group, including their plant-compatible acid addition salts with organic and inorganic acids and their metal complex salts.

4,479,005
SELECTIVE PREPARATION OF ISOMERS AND ENANTIOMERS OF CYCLOPROPANE CARBOXYLIC ACIDS

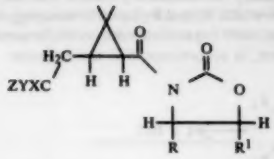
William A. Kleschick, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1982, Ser. No. 450,500

Int. Cl.³ C07D *263/26;* **C07C** *69/74*

U.S. Cl. 548—230 **20 Claims**

1. A compound corresponding to formula III



(III)

wherein X and Y are each independently halo, C_1 to C_4 perhaloalkyl, C_1 to C_4 alkyl, —CN, $—CO_2R''$ or $—CONR''_2$, wherein R'' at each occurrence is C_1 to C_4 alkyl, Z is —Br or —Cl and R and R^1 are each independently hydrogen, C_1 to C_4 alkyl, phenyl, benzyl or $—CH_2CH_2SCH_3$.

4,479,006
PROCESS FOR THE PREPARATION OF 1-CARBAMOYL-3-(3,5-DICHLOROPHENYL)-HYDANTOINS

Georges Gros, Bourg la Reine, and Marc Molin, Neuilly sur Marne, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

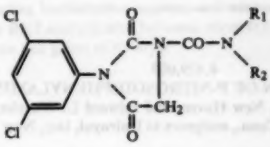
Continuation of Ser. No. 260,175, May 4, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,382

Claims priority, application France, May 29, 1980, 80 12238; Apr. 17, 1981, 81 07962

Int. Cl.³ C07D *233/80, 233/82*

U.S. Cl. 548—312 **25 Claims**

1. A process for the preparation, starting from 3-(3,5-dichlorophenyl)-hydantoin, of a compound of the formula:

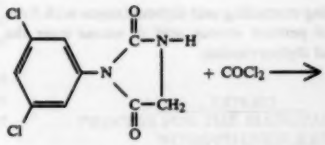


(I)

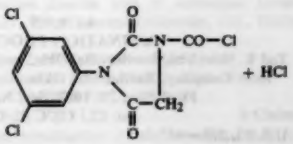
in which

R_1 is an alkyl radical containing from 1 to 4 carbon atoms or the phenyl radical and R_2 is a hydrogen atom or an alkyl radical containing from 1 to 4 carbon atoms, which comprises:

in a first step, reacting phosgene with 3-(3,5-dichlorophenyl)-hydantoin in an inert organic solvent medium, in the presence of at least stoichiometric amount of acid acceptor, in order to form 1-chlorocarbonyl-3-(3,5-dichlorophenyl)-hydantoin, in accordance with the equation:

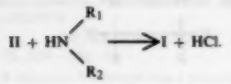


(II)



and,

in a second step, reacting at 20°–80° C. the resulting product with a primary or secondary amine of the formula HNR_1R_2, in which R_1 and R_2 have the meanings indicated above, in an inert organic solvent, in the presence of an acid acceptor, in accordance with the equation:



4,479,007

CHROMAN-4-ONES AND PROCESS FOR PREPARING SAME

Hans-Joachim Kabbe, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 897,899, Apr. 18, 1978, abandoned, which is a division of Ser. No. 853,932, Nov. 22, 1977, abandoned, which is a continuation of Ser. No. 706,098, Jul. 16, 1976, abandoned. This application Jul. 23, 1979, Ser. No. 59,860

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1974, 2535338; Mar. 20, 1976, 2611910

Int. Cl.³ C07D *311/22*

U.S. Cl. 549—401 **1 Claim**

1. A compound which is 2,5,7,8-Tetramethyl-6-hydroxy-2-(4',8',12'-trimethyl-trideca-3',7',11'-trienyl)-chroman-4-one.

4,479,008

PREPARATION OF P-NITROSODIPHENYLAMINE

Wadim Batorewicz, New Haven, and Edward L. Wheeler, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,104

Int. Cl.³ C07C *76/00, 81/00*

U.S. Cl. 564—433 **2 Claims**

1. An improved process for preparing p-nitrosodiphenylamine hydrochloride from N-nitrosodiphenylamine and hydrogen chloride, the improvement comprising carrying out said process in the presence of a C_5–C_{10} saturated aliphatic alcohol essentially in the absence of an aromatic solvent;

wherein said N-nitrosodiphenylamine is prepared by contacting diphenylamine with sodium nitrite and dilute sulfuric acid in the presence of a C_5–C_{10} saturated aliphatic alcohol essentially in the absence of an aromatic solvent; and

further comprising contacting said diphenylamine with from 0.1 to 20 mol percent nitrous acid in excess over the amount of said diphenylamine.

4,479,009

AMINATION PROCESS

Tod K. Shioyama, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1982, Ser. No. 445,310

Int. Cl.³ C07C *85/06*

U.S. Cl. 564—447 **14 Claims**

1. A process for the conversion of cyclic alcohols to cyclic amines comprising contacting one or more cyclic alcohols with an amination agent and a catalyst in the presence of one or more solvents of the general formula:

RR'NH

where R is hydrogen, a C_1 to C_4 alkyl group, or a C_1 to C_6 alkylene bridge, and R' is an alkyl group having from 1 to about 16 carbon atoms.

4,479,010

PROCEDURE FOR THE ALKOXYLATION OF POLYOXYALKYLENEAMINES

Michael Cuscurida, Austin, and Walter P. Krause, Georgetown, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,406

Int. Cl.³ C07C *85/00*

U.S. Cl. 564—477 **13 Claims**

1. A method for alkoxylating polyoxyalkyleneamines comprising

a. adding at least one alkylene oxide to an aqueous polyoxyalkyleneamine where

(1) the alkylene oxide has from 2 to 4 carbon atoms,

(2) the polyoxyalkyleneamine has a molecular weight of from 200 to 5,000,

(3) the proportion of water ranges from 5 to 15 wt.% based on the polyoxyalkyleneamine quantity, and

(4) the addition is conducted at a temperature between about 75° and 85° C., and

b. digesting the mixture of oxide and polyoxyalkyleneamine at a temperature between about 75° C. and 135° C. to give an alkoxylated polyoxyalkyleneamine product having a tertiary amine content of from 90 to 100%.

4,479,011

PROCESS FOR THE PREPARATION OF POLYUNSATURATED CYCLOALIPHATIC KETONES

Karl H. Schulte-Elte, Onex; Roger L. Snowden, Grand-Lancy, and Bernard L. Muller, Geneva, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Jun. 25, 1982, Ser. No. 391,995

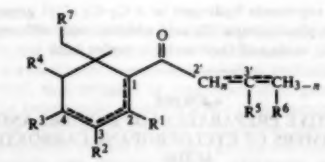
Claims priority, application Switzerland, Jul. 23, 1981, 4809/81

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

Int. Cl.³ C07C *45/51*

U.S. Cl. 568—361 **6 Claims**

1. A process for the preparation of polyunsaturated cycloaliphatic ketones having formula

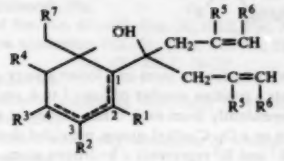


(I)

having a double bond in position 2' or 3' of the side chain and possessing either an isolated double bond in position 1 or 2, or two conjugated double bonds in positions 1 and 3 of the ring, as indicated by the dotted lines, and wherein

index n stands for integer 1 or 2, and

each of the symbols R^1 to R^7, identical or different, designates a hydrogen atom or a lower alkyl radical,
which comprises treating a diallyl carbinol of formula



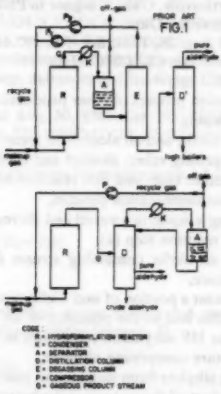
(II)

wherein symbols R^1 to R^7 and the dotted lines have the meaning given above, with at least a stoichiometric amount of a strong base in an inert organic solvent.

4,479,012
RECOVERY OF ALDEHYDES FROM HYDROFORMYLATION REACTION GAS

Karl Fischer, Worms; Armin V. Grenacher, Mutterstadt; Manfred Herr, Wachenheim, and Max Strohmeyer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,565
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114147
Int. Cl.³ C07C *45/50*; B01D *3/14*
U.S. Cl. 568—454 **9 Claims**



1. In a process for recovering an aldehyde from the gaseous product obtained by the hydroformylation of an olefinically unsaturated compound in a reactor R at elevated temperature and pressure while using a rhodium catalyst, the improvement which comprises:

(a) introducing said gaseous product, without being cooled or depressured, from the hydroformylation reactor R into a distillation column D for distillation in countercurrent with a liquid phase;

(b) cooling the top fraction from said column D in a condenser K so that the greater part of the aldehyde contained therein is condensed;

(c) separating the condensate in a separator A into a gas phase and a liquid phase;

(d) separating off a portion of the gas phase from A as a waste gas, and then bringing the remaining portion of the gas phase from A to the hydroformylation pressure by means of a compressor P and returning it to the reactor R as a recycle gas;

(e) returning the liquid phase from separator A to an upper part of the distillation column D to flow countercurrently with respect to the gaseous product; and

(f) taking off the aldehyde from a lower part of column D.

4,479,013
CATALYST AND PROCESS FOR UNSATURATED ALDEHYDES

Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation of Ser. No. 327,848, Dec. 7, 1981, Pat. No. 4,374,759, which is a continuation of Ser. No. 939,645, Sep. 5, 1978, abandoned. This application Jul. 9, 1982, Ser. No. 396,970
Int. Cl.³ C07C *45/34*
U.S. Cl. 568—479 **4 Claims**

1. A process for the preparation of methacrolein, which comprises oxidizing about 2–20 volume percent of isobutylene and/or tertiary butyl alcohol in the vapor-phase with about 4–20 volume percent molecular oxygen and up to about 30 volume percent steam at a temperature in the range of about 250°–500° C. and a pressure up to about 15.1 Kg/cm^2 absolute in the presence of a catalyst composition consisting essentially of the oxides of molybdenum, cobalt, iron, bismuth, thallium, antimony, nickel, silicon, and a member of the group consisting of the alkali metals, alkaline earth metals, the rare earth metals including lanthanum, tungsten, and mixtures thereof, and having a BET surface area between about 0.5 and about 10 square meters per gram of catalyst.

4,479,014
Patent Not Issued For This Number

4,479,015
PROCESS FOR THE MANUFACTURE OF NITROPHENETOLES

Yoel Sasson, and Shmuel Zbaida, both of Jerusalem, Israel, assignors to GADOT, Petrochemical Industries, Ltd., Haifa, Israel

Filed Jan. 7, 1983, Ser. No. 456,521
Claims priority, application Israel, Mar. 3, 1982, 65154
Int. Cl.³ C07C *79/35*, *41/16*
U.S. Cl. 568—584 **9 Claims**

1. A process for the manufacture of substantially pure nitrophenetole (ortho or para) from the respective nitrochlorobenzene, ethanol and solid alkali hydroxide, comprising reacting

said reactants in a two phase catalytic reaction system which comprises an organic phase and a solid phase in a substantial absence of water, in the presence of a tetramethylammonium salt having the formula $(CH_3)_4NX$, wherein X is Cl^{-1}, Br^-, HSO_4^- or OC_2H_5.

4,479,016

ETHOXYLATES OF DIACETYLENE ALCOHOLS AND THE USE OF THESE COMPOUNDS AS SURFACTANTS

Erhard Klahr, Ludwigshafen; Walter Rebafka, Eppelheim; Axel Nissen, Leimen; Wolfgang Trieselt, Ludwigshafen, and Albert Hettche, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

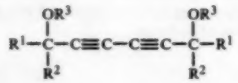
Filed Jun. 23, 1982, Ser. No. 391,180

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125109

Int. Cl.³ C07C *43/14*

U.S. Cl. 568—606 **9 Claims**

1. A composition of matter having the structural formula:



wherein R^1 and R^2 are individually selected from the group consisting of alkyl radicals having 1 to 10 carbon atoms and C_5 or C_6 cycloalkyl radicals; and wherein R^3 is $-(-CH_2CH_2O-)_n-H$ wherein n is an integer from 1 to 25.

4,479,017

PROCESS FOR PRODUCING ETHER COMPOUNDS BY CATALYTIC HYDROGENOLYSIS

Tadashi Ayusawa, Yatabe; Tadamichi Aoki, and Yutaka Nomura, both of Ami, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

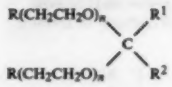
Filed Jun. 23, 1982, Ser. No. 391,304

Claims priority, application Japan, Jun. 29, 1981, 56-99766; Apr. 12, 1982, 57-59756

Int. Cl.³ C07C *41/00, 41/28*

U.S. Cl. 568—613 **6 Claims**

1. In a process for producing an ether compound by the catalytic hydrogenolysis of an acetal compound in the presence of a catalyst, the improvement wherein an acetal compound of the following formula (2)'



(2)'

wherein

R represents a hydrogen atom or a lower alkoxy group, n represents a positive number of from 1 to 4, and R^1 and R^2, independently from each other, represent a hydrogen atom or a C_1–C_4 alkyl group, provided that at least one of R^1 and R^2 represents a hydrogen atom,

is catalytically hydrogenolyzed in the presence of a palladium catalyst on a carrier in the absence of an acid substance added, thereby to form an ether compound of the following formula (1)'

$$R(CH_2CH_2O)_nCHR^1R^2 \quad (1)'$$

wherein

R, R^1, R^2, and n are as defined.

4,479,018

COMBINED ETHER AND ALKYLATE PRODUCTION

Joe Van Pool, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1981, Ser. No. 297,461

Int. Cl.³ C07C *41/06*

U.S. Cl. 568—697 **6 Claims**

1. In a combination process of ether production and alkylate production comprising

(a) reacting an olefin and an alcohol to form a first reaction mixture comprising ether, alcohol and olefin,

(b) recovering ether from said first reaction mixture as a first product of the combination process,

(c) accumulating a liquid in a vessel and thereafter using said liquid in the reaction step (a),

(d) separating an olefin containing stream from said first reaction mixture,

(e) reacting at least a portion of said olefin containing stream with isoparaffin and in the presence of an HF alkylation catalyst under HF alkylation conditions to form a second reaction mixture comprising alkylate,

(f) recoverying alkylate from said second reaction mixture as a further product of the process as the bottom stream from a fractionation zone in which at least a portion of the organic phase of said second reaction mixture is fractionated and which fractionation zone is provided with an overhead accumulator in which cooled condensed overhead effluent from said fractionation zone is accumulated,

the improvement comprising

pressurizing said vessel for liquid accumulation with a pressurizing material in gaseous form, which material is essentially free of air, oxygen, nitrogen, hydrogen, methane, ethane, and ethylene, which material is compatible with the HF alkylation reaction and with the ether forming reaction and which pressurizing material has a boiling point above the operating temperature of said overhead accumulator at its operating pressure and which pressurizing material has a boiling point below the operating temperature of said vessel at its operating pressure, and which material is a non-aromatic hydrocarbon having at least three carbon atoms, or with a mixture of such pressurizing materials.

4,479,019

COMPLEX FORMED TO SEPARATE NITRATED PHENOLIC COMPOUNDS FROM OTHER PHENOLIC COMPOUNDS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 431,640, Sep. 30, 1982, Pat. No. 4,447,654. This application Feb. 21, 1984, Ser. No. 582,083
Int. Cl.³ C07C 79/22
U.S. Cl. 568—709 2 Claims

1. A complex consisting essentially of p-nitrophenol and calcium bromide.

2. A complex consisting essentially of 4-nitro-m-cresol and calcium bromide.

4,479,020

PRODUCTION OF HALOHYDRINS

George D. Sucio, Ridgewood; Joon T. Kwon, Freehold Township, Monmouth County, and Atef M. Shaban, Nutley, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Nov. 12, 1982, Ser. No. 440,952
Int. Cl.³ C07C 31/34, 31/36
U.S. Cl. 568—850 17 Claims

1. A process for producing halohydrin, comprising:

reacting an olefinically unsaturated compound with a tertiary alkyl hypohalite in the presence of water and at least one metal selected from the Group consisting of II-A, II-B, III-A, III-B, IV-A, IV-B and V-A metals of the Periodic Table in an amount effective to increase production of halohydrin.

4,479,021

CONTINUOUS PROCESS FOR PRODUCING 1,2-ALKANEDIOLS

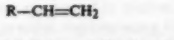
Heinz Issler, Bensheim, and Rudolf Maul, Lorsch, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,923
Int. Cl.³ C07C 31/20, 27/02, 29/86
U.S. Cl. 568—868 17 Claims

1. A continuous process for producing a 1,2-alkanediol of the formula I

(I)

in which R is an alkyl group having 3–6 carbon atoms, by reaction of a 1-alkene of the formula II



(II),

in which R is as defined under the formula I, with formic acid and hydrogen peroxide, and subsequent saponification of the formed alkanediol monoformate, which process is performed in several consecutive reaction stages, the procedure being such that the amount of reactants and/or reaction mixture being fed into a reaction stage always corresponds to the amount of reaction mixture being removed; and that the 1-alkene of the formula II, formic acid and hydrogen peroxide are introduced in controlled amounts in the molar ratio of 1.0:0.8–2.0:1.0–1.5, at a temperature of 0°–60° C., into the first stage; that the reaction mixture leaving the first reaction stage is held at 30°–60° C. in a second reaction stage; and that the reaction mixture emerging from the second reaction stage is transferred to a third reaction stage in which a temperature of 60°–80° C. and, by the addition of concentrated aqueous alkali, a pH value of 10–11 are maintained; and that from the reaction mixture leaving the third reaction stage the formed 1,2-alkanediol of the formula I is separated by extraction with an organic solvent and obtained from the extract by removal of the solvent by distillation.

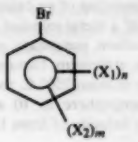
4,479,022

ISOMERIZATION OF BROMOHALOGENOBENZENES

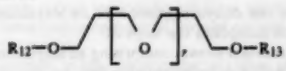
Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Apr. 6, 1982, Ser. No. 365,994
Claims priority, application France, Apr. 8, 1981, 81 07026
Int. Cl.³ C07C 17/24
U.S. Cl. 570—202 37 Claims

1. A process for the isomerization of a bromohalogenobenzene, comprising contacting (i) a bromohalogenobenzene having the structural formula:



wherein X_1 and X_2, which may be the same or different, are each a chlorine or fluorine atom, and n and m are numbers greater than or equal to 0 and less than or equal to 3, with the sum of n+m being equal to 2 or 3, with (ii) an alkaline base and (iii) at least one catalyst compound which forms a complex with the cation of said alkaline base, said compound (iii) which forms a complex with the cation of the alkaline base is a linear polyether having the structural formula:



(III)

wherein r ranges from 1 to 10 and wherein R_{12} and R_{13}, which may be the same or different, each represents an alkyl radical having from 1 to 12 carbon atoms.

4,479,023

PROCESS FOR THE OLIGOMERIZATION OF LIGHT OLEFIN FRACTIONS IN THE PRESENCE OF A BORON TRIFLUORIDE CATALYST

Claude Marty, and Philippe Engelhard, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,328
Int. Cl.³ C07C 3/18, 7/00
U.S. Cl. 585—312 20 Claims

1. A process for the oligomerization of a light olefin fraction containing isobutene or butadiene which favors the yield of lower boiling point oligomers, which comprises:

as a pretreatment, contacting the olefin fraction with boron trifluoride in a gas phase in the absence of a catalyst carrier such that isobutene and/or butadiene are selectively polymerized;

separating boron trifluoride and the resulting isobutene and/or butadiene polymers from the other substantially unreacted olefins of said light olefin fraction to form a purified olefin fraction from which most of the isobutene and butadiene has been removed;

treating the purified fraction with a boron trifluoride catalyst containing an alumina catalyst carrier having a specific surface of from 20 to 120 m^2g and a pore volume between 0.10 and 0.80 cm^3/g such that the light olefins are oligomerized producing an oligomeric product significantly richer in the 60°–120° C. light fraction and with significantly less of a residue having a boiling point over 320° C. than a product produced by the same oligomerization process which omits said pretreatment.

4,479,024

STYRENE FROM TOLUENE AND FORMALDEHYDE

Philippe M. Bruylants, Ekersen, Belgium, and Robert L. Garten, Cupertino, Calif., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 1, 1983, Ser. No. 500,039
Int. Cl.³ C07C 3/52
U.S. Cl. 585—437 **4 Claims**

1. A process of producing styrene from toluene and formaldehyde which comprises:

Contacting a gas comprised of toluene and formaldehyde, the formaldehyde being from 0.001 to 0.10 mole per one mole toluene with a catalyst comprised of a basic compound selected from the group consisting of an oxide and hydroxide, and mixtures thereof, of a metal selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, barium and mixtures thereof, at a temperature of from 250° C. to 450° C., at a pressure of from 0.1 atmosphere to 10 atmospheres, and at a volumetric space velocity of from 100 to 5000 reciprocal hours ($hr.^{-1}$).

4,479,025

ALKYLAROMATIC HYDROCARBON DEHYDROGENATION PROCESS

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

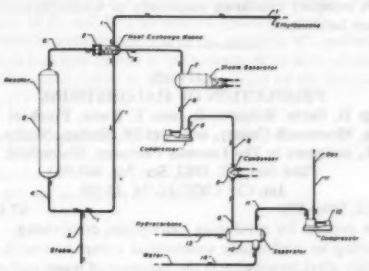
Filed Nov. 22, 1982, Ser. No. 443,722
Int. Cl.³ C07C 5/36
U.S. Cl. 585—441 **11 Claims**

1. A process for the dehydrogenation of an alkylaromatic hydrocarbon which comprises the steps of:

(a) contacting a reactant stream comprising an alkylaromatic hydrocarbon with a dehydrogenation catalyst maintained at dehydrogenation conditions which include a subatmospheric pressure and thereby forming a vapor-phase dehydrogenation zone effluent stream comprising the alkylaromatic hydrocarbon, an unsaturated product hydrocarbon and hydrogen;

(b) cooling the dehydrogenation zone effluent stream without significant condensation of either water or C_6^+ hydrocarbons and not more than 5 mole percent of any compound or class of compounds by indirect heat exchange against the reactant stream;

(c) compressing the dehydrogenation zone effluent stream to a higher pressure less than 1 atmosphere absolute by means of a first mechanical compressing means;



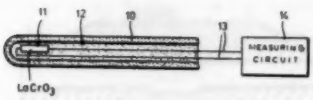
(d) partially condensing the dehydrogenation zone effluent stream;

(e) separating the resultant mixed-phase dehydrogenation zone effluent stream in a vapor-liquid separation zone, maintained at a pressure less than 1 atmosphere absolute through the use of a second mechanical compressing means, into a vapor-phase stream comprising hydrogen and a liquid-phase process stream; and (f) recovering the unsaturated product hydrogenation from the liquid-phase process stream.

4,479,026
MEASURING RESISTOR FOR A NOISE THERMOMETER

Heinz Brixy, Niederzier; Detmar von Mallinckrodt, and Volker Justus, both of Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,451
Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219168
Int. Cl.³ H01L *35/02*
U.S. Cl. 136—232 **7 Claims**

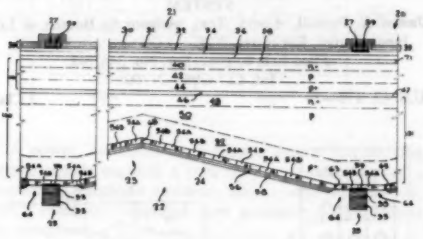


1. In a noise thermometer wherein a resistive sensing element is exposed to an elevated temperature and the noise voltage output thereof is detected by a measuring circuit, the improvement wherein said element consists of lanthanum chromite.

4,479,027
MULTI-LAYER THIN-FILM, FLEXIBLE SILICON ALLOY PHOTOVOLTAIC CELL

William J. Todorof, 590 Cress St., Laguna Beach, Calif. 92651

Filed Sep. 24, 1982, Ser. No. 422,944
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—249 **38 Claims**



27. A multi-junction cell comprising: front and rear juction regions positioned in tandem one in front of the other, each of said junction regions being formed of a glassy silicon alloy, the spectral sensivity of the rear junction region being different from the spectral sensitivity of the front junction region said front and rear junction regions being optically and electrically coupled together in series by an intervening thin, optically transparent lattice matching layer, first electrical contact means associated with the front of the cell and second electrical contact means associated with the rear of the cell for operating the two junction regions in series.

4,479,028
AMORPHOUS SOLAR CELL

Kazuhiko Sato; Genshiro Nakamura, and Yoshinori Yukimoto, all of Hyogo, Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,341
Claims priority, application Japan, Feb. 15, 1982, 57-21047
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—249 **7 Claims**

1. A solar cell, comprising:

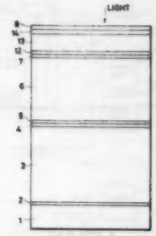
a first, p-type semiconductor layer of a first amorphous semiconductor material;

a second, intrinsic semiconductor layer of a second amorphous semiconductor material having an energy-gap lower than the gap of said first amorphous semiconductor material and formed on said first semiconductor layer;

a third, n-type semiconductor layer of said first amorphous semiconductor material formed on said second semiconductor layer;

a fourth, p-type semiconductor of said first amorphous semiconductor material formed on said third semiconductor layer;

a fifth, intrinsic semiconductor layer of said first amorphous semiconductor material formed on said fourth semiconductor layer;



a sixth, n-type semiconductor layer of said first amorphous semiconductor material formed on said fifth semiconductor layer;

a seventh, p-type semiconductor layer of said amorphous semiconductor material formed on said sixth semiconductor layer;

an eighth, intrinsic semiconductor layer of said first amorphous semiconductor material formed on said seventh semiconductor layer; and

a ninth, n-type semiconductor layer of said first amorphous semiconductor material formed on said eighth semiconductor layer, said ninth semiconductor layer having an incident light receiving surface.

4,479,029
BIPOLAR FLEXIBLE WATER-COOLED CABLE

Mikhail D. Banov; Anatoly I. Oshkin, and Alexandr N. Chernyshev, all of Kuibyshevskol, U.S.S.R., assignors to Toliyattinsky Politekhnichesky Institut, U.S.S.R.

PCT No. PCT/SU81/00008, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982, PCT Pub. No. WO81/02616, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 28, 1981, Ser. No. 422,901
Int. Cl.³ H01B *7/34*
U.S. Cl. 174—15 WF **5 Claims**

1. A bipolar flexible water-cooled cable comprising a positive conductor and one or more return conductors, which are insulated from said positive conductor, said positive and return

conductors being placed in a hose of an insulating material, wherein the improvement comprises the positive conductor extending along the cable axis and positioned in an insulating sheath with a gap between the positive conductor and said insulating sheath for passage of a cooling agent; and said one or more return conductors being wound on the insulating sheath at an angle = 15° to 82° to the longitudinal axis of the cable, the diameter D_0 of the return conductor and the diameter D_1 of the positive conductor being related as follows:

$$D_0 = \frac{D_1}{\sqrt{n}},$$

where n is the number of said return conductors.

4,479,030

FREE STANDING SUPPLY COLUMN, ESPECIALLY FOR OFFICES

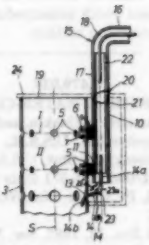
Arno Votteler, Stuttgart, Fed. Rep. of Germany; Max Danuzzi, Weisslingen, Switzerland; Fredi Dubach, Adetswil, Switzerland, and Herbert Schreiner, Frauenfeld, Switzerland, assignors to Planmöbel Eggersmann GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,346

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128085

Int. Cl.³ H02G 3/00

U.S. Cl. 174—48 **16 Claims**



1. A free standing supply column for supplying energy and delivering communications via supply lines to and away from work devices, said supply column comprising:

a base;

a column vertically arranged on said base and having a central axis;

a plurality of vertical pipe sections associated with the upper portion of said column and adapted to accommodate said supply lines, each pipe section having a central axis, said central axes of said pipe sections being arranged circularly around said central axis of said column; and

radial, horizontally pivotable supporting arms serving to support said work devices and accommodate said supply lines, each supporting arm comprising an at least nearly horizontal section, and a vertical section connected to said horizontal section and held on an associated pipe section in such a way as to be adjustable in height.

4,479,031

HEAT-SHRINKABLE TUBE WITH SEMICONDUCTIVE PARTS FOR USE IN JOINING ELECTRICAL CABLES

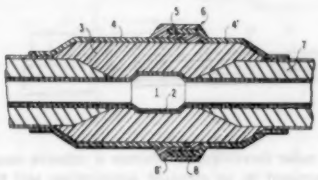
Kojiro Ishise, and Keiichi Kojima, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

Division of Ser. No. 168,228, Jul. 10, 1980, abandoned. This application Oct. 9, 1981, Ser. No. 310,245

Claims priority, application Japan, Jul. 10, 1979, 54-87641; Jul. 10, 1979, 54-87642

Int. Cl.³ H02G 15/18, 15/08

U.S. Cl. 174—73 R **4 Claims**



1. A heat-shrinkable tube for use in forming a connection part for shielded polyolefin insulated electrical wires or cables which comprises an integrated assembly of two cylindrical heat-shrinkable semiconductive members arranged end-to-end, and a specific insulated portion consisting of said two cylindrical heat-shrinkable semiconductive members surrounded and joined at the adjacent ends thereof by an insulation material.

4,479,032

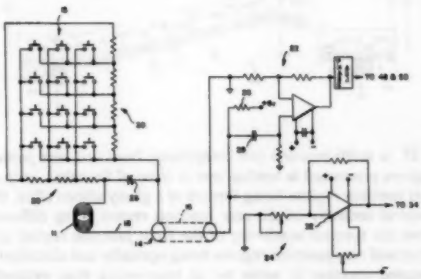
DIGITIZING CURSOR AND COORDINATE GRID SYSTEM

James A. Parnell, Austin, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,792

Int. Cl.³ G08C 21/00

U.S. Cl. 178—19 **2 Claims**



1. A digitizing cursor assembly for use with a digitizing pad incorporating grid lines and digitizing circuitry for processing digitizing command signals and coordinate location signals remote from the cursor assembly, comprising:

a cursor housing;

a multiturn coil within the cursor housing for providing coordinate location signals induced in the coil as a function of proximately located electrically energized grid lines;

a cursor control panel mounted integral with the cursor housing including a multiplicity of control switches in electrical communication with a resistive network for providing a unique command signal as a function of each of the multiplicity of control switches engaged on the cursor control panel; and

a coaxial cable in electrical communication with the

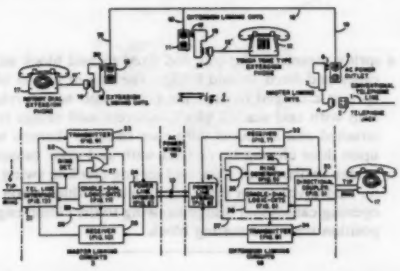
switches and resistive network integrally mounted at one end with the cursor housing for providing an electrical path for both the unique command signals and the coordinate location signals from the cursor housing to remotely located digitizing circuitry for processing the command signals and coordinate location signals.

4,479,033

TELEPHONE EXTENSION SYSTEM UTILIZING POWER LINE CARRIER SIGNALS

William M. Brown, Acton, and Robert T. Dunn, Bedford, both of Mass., assignors to Astech, Inc., Bedford, Mass.

Filed Mar. 29, 1982, Ser. No. 363,063
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2.51 9 Claims



1. A power line telephone extension system for carrying electrical signals between a subscriber's telephone line of a conventional telephone communication system and the subscriber's extension telephone over available electric power wires comprising,

(a) a master location including master linking circuits for processing the signals, electrically coupled between the subscriber's telephone line and power wires,

(b) an extension location along said power wires including an extension telephone having a tip line and extension linking circuits for processing the signals, electrically coupled between the extension telephone and power wires and

(c) a directional coupler electrically coupled between the extension linking circuits and the extension telephone,

(d) the directional coupler including first and second coils inductively coupled together

(e) the first coil being in electrical series with the extension telephone tip line and

(f) the second coil being coupled at one end to a first signal flow path in the extension linking circuits and at the other end to a second signal flow path in the extension linking circuits,

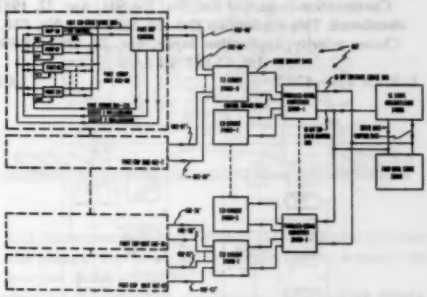
(g) whereby the power wires carry the electrical signals between the subscriber's telephone line and extension telephone and signals from the extension telephone to the telephone line flow along the first path while signals from the telephone line to the extension flow along the second path.

4,479,034

ARRANGEMENT OF INTERACTIVE PROCESSORS FOR CONTROL OF PORTS

Barrie Brightman, Fern Park; Thomas E. Ellis, Altamonte Springs, both of Fla.; James E. Jones, Littleton, Colo.; Pedro A. Lenk, Fern Park, Fla.; William H. Stewart, Longwood, Fla., and John W. Woodward, Longwood, Fla., assignors to Stromberg-Carlson Corp., Longwood, Fla.

Continuation of Ser. No. 290,531, Aug. 6, 1981, abandoned, which is a continuation of Ser. No. 924,883, Jul. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 864,401, Dec. 27, 1977, abandoned. This application Jun. 23, 1983, Ser. No. 507,935
Int. Cl.³ H04M *3/02*; H04Q *3/54*
U.S. Cl. 179—18 ES 25 Claims



23. A control system for a telephone switching system that interconnects a plurality of telephone lines each connected to a port, each port transferring, to and from its connected telephone line, information in the form of supervisory signals representing telephone line conditions and other signals representing intelligence, said control system comprising:

A. port storage means for storing a plurality of port status information items representing different conditions for each port and its connected line;

B. port event processing means connected to said port storage means for altering certain of said port status information items in said port storage means in response to other port storage status information items; and

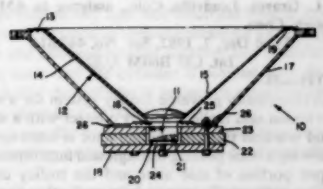
C. call processing means connected to said port storage means for altering port status information in said port storage means in response to other port status information in accordance with a predetermined sequence of call progression steps thereby to control the operation of said port event processing means.

4,479,035

CERAMIC VOICE COIL ASSEMBLY

Jay E. Philippbar, 33821 Castano Dr., Dana Point, Calif. 92629

Filed May 23, 1983, Ser. No. 497,269
Int. Cl.³ H04R *9/04*
U.S. Cl. 179—115.5 VC 7 Claims



1. An improved voice coil assembly comprising:

a. a ceramic voice coil form which is formed out of a high temperature ceramic material and which has an outer surface and an inner surface;

b. transducer windings having a first end and second end which are formed by a molybdenum-manganese metallization which is disposed on said outer surface of said voice coil form; and

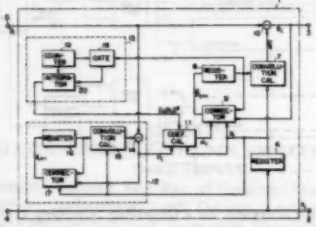
c. lead wires mechanically and electrically coupled to said first and second ends of said transducer windings.

4,479,036

ECHO CONTROL SYSTEM

Seiichi Yamamoto, Kokubunji, and Seishi Kitayama, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 256,601, Apr. 22, 1981, abandoned. This application Oct. 14, 1982, Ser. No. 434,271
Claims priority, application Japan, Apr. 28, 1980, 55-55510
Int. Cl.³ H04B 3/20
U.S. Cl. 179—170.2 2 Claims



1. An echo control system for an adaptive echo canceller which forms a pseudo-echo by performing a convolution calculation with a first function signal indicative of a received signal and a second function signal indicative of an estimated characteristic of an echo path, substracts the pseudo-echo from an echo signal for developing a residual echo signal, and corrects the estimated characteristic using an amount of correction obtained by the residual echo signal, the first function signal and a correction coefficient signal characterized by a circuit noise estimation circuit receptive of the first function signal and connected to the echo path for estimating a circuit noise of the echo path, a parameter error estimation circuit receptive of the second function signal for estimating a parameter error between the characteristic of the echo path and its estimated characteristic, and a coefficient calculator receptive of the first function signal, the circuit noise and the parameter error for determining the correction coefficient signal obtained with the circuit noise, the parameter error and the received signal, wherein the said estimated characteristic of the echo path is corrected in accordance with the result of multiplication of the amount of correction and the correction coefficient.

4,479,037

TROLLEY BRIDGE

William L. Graves, Leadville, Colo., assignor to AMAX Inc., Greenwich, Conn.

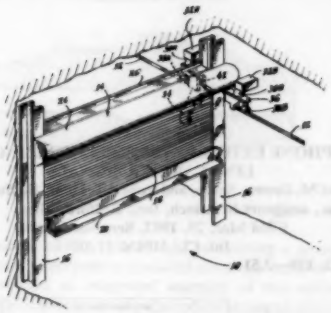
Filed Dec. 7, 1982, Ser. No. 447,614
Int. Cl.³ B60M 1/20
U.S. Cl. 191—36 4 Claims

1. In an electrically powered trolley system for a mine and the like wherein said trolleys run by contact with a solid conductor and wherein the trolley conductor is interrupted from time to time by a door passing through said interruption to seal off an open portion of said mine and the trolley conductor terminals are horizontally spaced from each other to provide a clearance for said door, the invention of a bridge means comprising:

a bridge anchor block affixed to one of said conductors and arranged with a pivot socket and an arresting surface;

a bridge having one engageable end and a second end with a pivot portion socketly and pivotly held in the pivot socket of said anchor block and having an arresting stop surface arranged to engage said arresting surface of said anchor block to prevent said bridge from rising upward past the horizontal portion thereof;

a seating block on said other trolley conductor having a downwardly opening socket to disengageably receive said engageable end of said bridge where said bridge is in the horizontal position; and



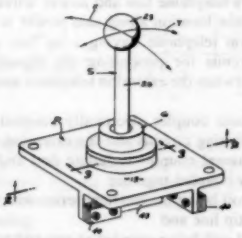
a spring means having one end fixed to said block and the other end fixed to said bridge, the line of action of said springs arranged to urge the bridge into socket relationship with said seating block, wherein said bridge is constructed and arranged with cam surfaces thereon which upon door closing by contact with said door causes said bridge to disengage from said seating block to swing same on said pivot to an open position and which upon door opening causes said bridge to swing to the closed engaged position with said seating block.

4,479,038

MODE CONDITIONED JOYSTICK CONTROL FOR VIDEO GAMES

Werner Marhold, and Danny J. Pool, both of Bishop, Calif., assignors to Cal-Tron Corporation, Bishop, Calif.

Filed Feb. 11, 1983, Ser. No. 446,508
Int. Cl.³ H01H 25/00
U.S. Cl. 200—6 A 25 Claims



1. A joystick control for the selective actuation of diametrically opposed switches placed in at least one pair on a horizontal axis intersecting a centered vertical axis of the joystick, and including;

a mounting plate fixedly carrying said switches and having a vertical opening therethrough comprised of a stepped cylindrical bore with an upwardly faced planar shoulder for support of the joystick,

the joystick having an upper leg of cylinder form extending upwardly from the opening in the mounting plate and to be tilted laterally and having a lower leg of cylinder form extending downwardly from the opening in the mounting plate and carrying a cam member at the plane of said hoizontal axes to engage and actuate said switches,

a flange on and for mounting and restricting lateral movement oif the joystick and having a planar bottom face supportably engageable flat upon the upwardly faced shoulder in said mounting plate bore,

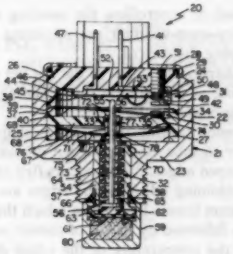
a compression spring means yieldingly biased between the bottom of the mounting plate and an upwardly faced seat carried by the joystick to maintain a downwardly assembled normally upright and centered condition of the joystick.

4,479,039

ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Frank Payne, Knoxville, Tenn., assignor to Robert Shaw Controls Company, Richmond, Va.

Filed Oct. 26, 1983, Ser. No. 545,518
Int. Cl.³ H01H *5/30, 13/66, 37/60*
U.S. Cl. 200—67 D **14 Claims**



1. In an electrical switch construction comprising a housing means, a pair of electrical switching units carried by said housing means, and condition responsive actuator means carried by said housing means and being operatively associated with said units to serially operate said units as said sensed condition respectively reaches two different predetermined conditions, said actuator means comprising an axially movable plunger for operating one of said units and a snap disc for operating the other of said units when snapped overcenter, said actuator means having a spring means operatively associated with said plunger and said snap disc to move said snap disc overcenter when said plunger is moved to a certain axial position thereof by said actuator means sensing one of said conditions, the improvement wherein said actuator means has a tubular member telescopically disposed on said plunger and operatively interconnecting said snap disc to said other unit when said snap disc is snapped overcenter.

4,479,040

TACTILE FEEL SWITCH WITH POSITIVE SWITCH ACTUATION

Ronald S. Denley, Woodstock, and Anthony J. Van Zeeland, Crystal Lake, both of Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Mar. 7, 1983, Ser. No. 473,032
Int. Cl.³ H01H *15/18*
U.S. Cl. 200—77 **8 Claims**

1. A switch having tactile feedback, comprising:

a housing;

a set of electrical contacts associated with the housing;

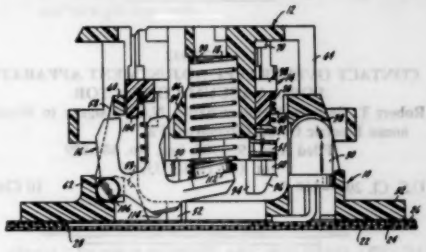
a reciprocative plunger mounted in the housing and movable through a stroke including an initial rest position, an actuator set portion, a switch closure point, an overtravel portion and a return portion;

an actuator in the housing, operable to close the electrical contacts;

a first spring engaging the plunger and the actuator;

blocking means for isolating the actuator from the contacts, the blocking means being releasably connected to the plunger and activated thereby during the actuator set portion of the plunger stroke;

a second spring engageable between the housing and the blocking means, the plunger compressing the first spring



and the second spring by virtue of the connection between the plunger and blocking means, during the actuator set portion of the stroke; and,

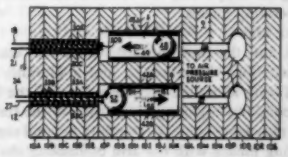
means for disconnecting the plunger and blocking means, operative when the plunger stroke reaches the switch closure point, thereby releasing the compression of the second spring, the second spring then deactivating the blocking means so that the compression of the first spring acts upon the actuator which closes the contacts while the sudden decrease in the plunger resistance provides tactile feedback.

4,479,041

PNEUMATIC BALL CONTACT SWITCH

Danny L. Fenwick, Springdale, Ohio, and Jon D. Hopkins, Unionville, Conn., assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 22, 1982, Ser. No. 443,826
Int. Cl.³ H10H *35/24*
U.S. Cl. 200—81 R **4 Claims**



1. A pneumatically operated electrical switch, comprising:

(a) a stack of metallic lamina containing a cylindrical chamber and diffusion bonded together and rotatable about an axis such that the cylinder is parallel with the axis and such that the cylinder is subject to a centrifugal acceleration exceeding 10,000 g's,

(b) two metallic conductors penetrating the chamber,

(c) insulating means for electrically insulating the conductors,

(d) a cylindrical insulator comprising sapphire and contained within the cylindrical chamber for electrically insulating the sphere from the stack of lamina,

(e) a first fluid passage communicting with the chamber for

admitting fluid pressure to urge the sphere into contact with the conductors, and

(f) a second fluid passage communicating with the chamber for admitting fluid pressure to disconnect the sphere from the conductors, and

(g) a movable, hollow glass sphere which

(i) has a conductive coating,

(ii) is contained within the cylindrical insulator of (e) and

(iii) can be rolled along the cylindrical insulator by application of fluid pressure of (e) during the rotation of (a).

4,479,042

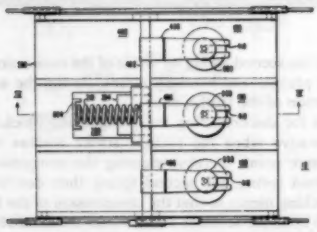
CONTACT OVERTRAVEL ADJUSTMENT APPARATUS FOR A VACUUM CONTACTOR

Robert T. Basnett, Hendersonville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1983, Ser. No. 486,589

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. A vacuum contactor, comprising:

vacuum interrupter means for opening and closing an electrical circuit including a moveable contact having a threaded shaft and being transferable between an open position and a closed position;

operating means for effecting relative movement of the moveable contact between the open and closed positions, the operating means including an arm having an opening through which a portion of the threaded shaft of the moveable contact extends;

a housing for supporting the vacuum interrupter means and the operating means;

a first nut; and

a second nut, the first nut and second nut each having a threaded bore therethrough and a plurality of radially spaced teeth about the periphery thereof, the first nut and the second nut engaging the portion of the threaded shaft of the moveable contact extending beyond the arm of the operating means with the arm contacting the first nut to hold the moveable contact in the open position and the first nut being spaced from the arm when the moveable contact is in the closed position, the space representing the overtravel gap for the vacuum interrupter means, the second nut contacting the first nut on the threaded shaft whereby the first nut and the second nut so positioned can be removably secured without the transmission of torque to the shaft of the moveable contact by the rotation of the blade of a screwdriver inserted between two teeth of the first nut and two teeth of the second nut, the screwdriver engaging diagonally opposite teeth in the first and second nuts, respectively, during the rotation thereof, the rotation of the blade in one direction tightening the first and second nuts with rotation of the blade in the opposite direction loosening the first and second nuts.

4,479,043

CONTROLLING THE ZONE OF LONGITUDINALLY SEAM-WELDING SPLIT TUBES

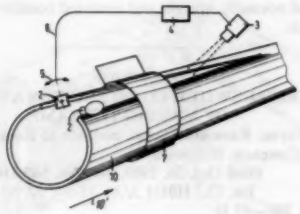
Walter Hess; Franz Nicolai, both of Mülheim; Erich Treiss, Duisburg, and Otto Götting, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,819

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1981, 3116364

Int. Cl.³ H05B *6/06*

U.S. Cl. 219—8.5 **1 Claim**



1. A method of controlling the welding zone pursuant to high-frequency-seam-welding the adjoining edges of a split tube, comprising the step of

convexly shaping the edges of the not yet closed tube prior to welding as preparation for obtaining a more uniform temperature across the edges;

high frequency heating the edges as shaped progressively just prior to tube closing so that on account of the convexly shaped edges, fusion occurs first in central portions of the adjoining edges as the edges are forced together downstream from a location in which the edges abut first, which is followed by fusion of corner portions thereof;

measuring the temperature of the edges downstream from heating; and

adjusting the shaping towards obtaining a variation in convexity to thereby modify the temperature distribution in the edges as heated.

4,479,044

ELECTRODE ASSEMBLY FOR TRAVELLING-WIRE ELECTROEROSION MACHINE

Kiyoshi Inoue, Tokyo, and Akihiko Shimizu, Kanagawaken, both of Japan, assignors to Inoue-Japax Research Incorporated, Yokohama, Japan

Division of Ser. No. 897,053, Apr. 17, 1978, Pat. No. 4,307,279. This application Jun. 5, 1981, Ser. No. 270,864

Claims priority, application Japan, Apr. 18, 1977, 52-44383; Jun. 15, 1977, 52-69800; Jul. 11, 1977, 52-81961; Aug. 4, 1977, 52-92974

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 W **17 Claims**

10. An electroerosion machine for cutting a desired contour in a projected edge or overhang portion of a workpiece with an axially-travelling elongate electrode, comprising:

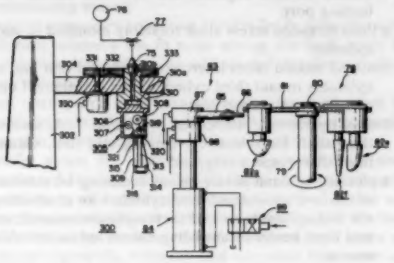
workpiece support means for retaining a workpiece;

rotatable electrode carriage means having an upper and a lower electrode guidance member for guiding the axially-travelling elongate electrode linearly therebetween in an electroerosive cutting relationship with the workpiece;

translational drive means for relatively displacing said carriage means and said workpiece support means in an essentially horizontal plane to transversely move the axially-travelling elongate electrode between said upper and lower guidance members in said portion of the workpiece

along a predetermined cutting path prescribed to correspond to a desired contour; and

rotary drive means for rotating said electrode carriage means about an essentially vertical rotary axis and in such



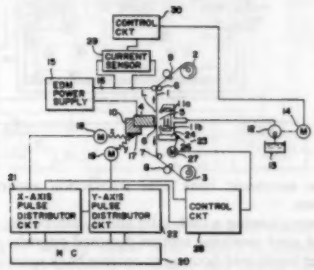
a manner as to avoid a collision of any part of said electrode carriage means with said workpiece as it may occur while the elongate electrode and the workpiece are transversely moved relative to each other along said predetermined cutting path.

4,479,045

TRAVELING-WIRE ELECTROEROSIVE CUTTING METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 10, 1982, Ser. No. 406,950
Claims priority, application Japan, Aug. 12, 1981, 56-127088
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 W **2 Claims**



1. In a method of traveling-wire electroerosive machining of an electrically conductive workpiece wherein a continuous electrode wire stretched under tension between a wire-supply side and a wire-takeup side is continuously transported axially to travel along a straight-line path between a pair of wire-guide members in an electroerosive cutting relationship with the workpiece, a machining fluid is supplied in a stream under a pressure into a cutting gap formed between the traveling electrode wire and the workpiece, and a succession of electrical machining discharges are effected across said gap to electroerosively remove stock from the workpiece while the traveling-electrode wire and the workpiece are relatively displaced transversely to said straight-line path to advance the electroerosive stock removal along a prescribed non-unirectilinear cutting path corresponding to a desired contour of cut to be machined in the workpiece, the improvement which comprises the steps of:

sensing a machining current passing between the traveling wire and the workpiece during said electrical discharges to produce a signal representing a pressure created in said cutting gap and tending to deflect said traveling electrode wire between said wire-guide members away from said straight line path; and

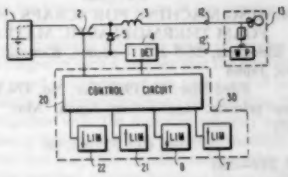
directionally controlling said stream of the machining fluid into said cutting gap so as to maintain said stream always directed into a workpiece region immediately behind the wire advancing, in spite of a change of direction of advance thereof, along said prescribed non-unirectilinear cutting path while simultaneously controlling the pressure of said machining fluid in said direction-controlled stream in accordance with said signal so as to counterbalance said wire-deflecting gap pressure, whereby to maintain said traveling electrode wire substantially in alignment with said straight line path.

4,479,046

SINGLE POWER SOURCE ARC WELDING APPARATUS

Masanori Mizuno, and Takaji Mizuno, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,306
Claims priority, application Japan, Apr. 14, 1982, 57-61874
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—130.32 **6 Claims**



1. A pulse arc welding apparatus, comprising:

(a) a D.C. voltage source (1),

(b) switching means (2) for coupling said source to a welding unit (13),

(c) a current detector (4) for detecting welding current supplied by said source, and

(d) a control unit (30) comprising an adjustable peak current upper limiter (7), an adjustable peak current lower limiter (8), an adjustable base current upper limiter (21), an adjustable base current lower limiter (22), and a control circuit (20) for generating signals for controlling said switching means to alternately supply peak current and base current pulses to said welding unit, said control circuit comprising a first base current comparator (33) and a second peak current comparator (32), means coupling said current detector output to a first input of each comparator, means coupling outputs of said base current upper and lower limiters to a second input of said first comparator, and means coupling outputs of said peak current upper and lower limiters to a second input of said second comparator, whereby each peak current pulse of the resultant welding current cyclically varies between amplitude levels established by said peak current upper and lower limiters, and each base current pulse similarly varies between amplitude levels established by said base current upper and lower limiters.

4,479,047

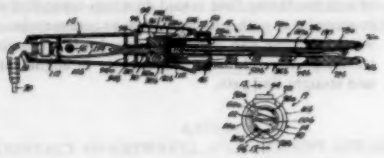
SPLIT BARREL ELECTRIC HAIR CURLER/STYLER

Farees U. Khaja, Chicago; Robert O. Ernest, Oak Park; Jerry P. Gronwick, Park Ridge, and Howard A. Bristol, Dolton, all of Ill., assignors to Sunbeam Corporation, Oak Brook, Ill.

Filed Jul. 12, 1982, Ser. No. 397,331

Int. Cl.³ A45D *1/02*; H05B *3/02*

U.S. Cl. 219—225 14 Claims



1. A curler/styler comprising an elongated handle having an elongated longitudinally split heating barrel projecting from the forward end thereof and defining a longitudinal space between the split portions of the barrel, said space being open at its forward end, and an elongated generally flat blade-like clamp projecting from said forward end of said handle in said space between the split portions of said heating barrel, said split heating barrel and said clamp being rotatable relative to one another about a longitudinal axis between a first position wherein the split portions of the barrel are spaced from the clamp so that strands of hair can be inserted therebetween and a second position wherein the inserted hair strands are clamped between engaged longitudinal edges of the split barrel portions and the clamp, and means for selectively rotating said barrel and clamp relative to each other.

4,479,048

RECLAIMING MACHINE FOR SCRAPS OF EXPANDED FOAM THERMOPLASTIC MATERIAL

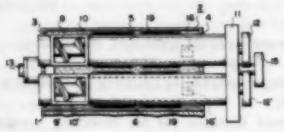
Tomoo Kinoshita, 26-9-203, 4-chome, Kameari, Katsushikaku, Tokyo, Japan

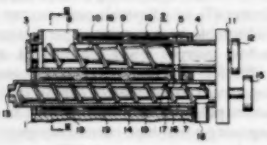
Filed Mar. 10, 1983, Ser. No. 474,127

Claims priority, application Japan, Mar. 10, 1982, 57-32671[U]

Int. Cl.³ F27B *9/06*

U.S. Cl. 219—388 6 Claims





1. A reclaiming machine for scraps of expanded foam thermoplastic material comprising:

an electric source;

a housing having a first and second material feeding port formed therein;

a first and second heat conductive cylinder positioned in the said housing and in connection with said first and second port, respectively;

a first and second threaded screw shaft rotatably mounted in said first and second cylinder, respectively, wherein the thread diameter of said first and second screw shafts increases in a direction away from said first and second port, respectively,

a third heat conductive cylinder located between said first and second cylinder and having a discharging port formed therein located adjacent the first and second material feeding port;

a third threaded screw shaft rotatably mounted in said third cylinder;

first and second tubes interconnecting said first and second cylinders to said third cylinder at an end thereof opposite said first and second port;

means operatively associated with said first, second and third shaft for selectively driving said first, second and third shaft respectively; and

a plurality of band heater means enclosing an external wall of the first, second and third cylinders for conducting heat via said cylinders to said thermoplastic material, each of said band heater means being connected to said electrical source.

4,479,049

AUTOMATIC BANK NOTE TRANSACTION APPARATUS

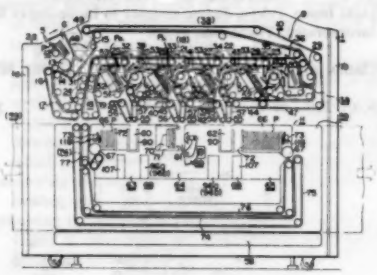
Minoru Hirose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 5, 1982, Ser. No. 337,244

Claims priority, application Japan, Jan. 22, 1981, 56-8514; Jan. 22, 1981, 56-8525; Apr. 6, 1981, 56-51538

Int. Cl.³ B65H *29/40*

U.S. Cl. 235—379 18 Claims



1. An automatic bank note transaction apparatus which comprises:

a housing having a cash inlet and a cash outlet;

a bank note receiving section disposed opposite to said cash inlet inside said housing to receive bank notes collectively put in said housing through said cash inlet;

first conveyance means for successively introducing and conveying the bank notes received in said bank note receiving section one by one;

discriminating means for discriminating the denomination of the bank notes introduced and conveyed by said first conveyance means;

first distributing means for sorting the bank notes by denomination according to the result of the discrimination by said discriminating means;

a plurality of first temporary collecting sections for separately depositing several denominations of notes, whereby the bank notes sorted out by said first distributing means are temporarily collected according to their respective denominations;

a plurality of safe sections each having a storage chamber for storing notes of one of said several denominations so that the stored bank notes may be taken out one by one;

second conveyance means for successively introducing and conveying the bank notes received in said storage chamber in said safe sections one by one to said discriminating means;

said discriminating means discriminating fit notes from unfit

notes among the bank notes for withdrawal taken out from said safe sections by said second conveyance means;

second distributing means for sorting the bank notes for withdrawal conveyed by the second conveyance means according to the result of the discrimination by said discriminating means;

a second temporary collecting section for fit notes for withdrawal, whereby the fit notes among the bank notes for withdrawal sorted out by said second distributing means are collected temporarily;

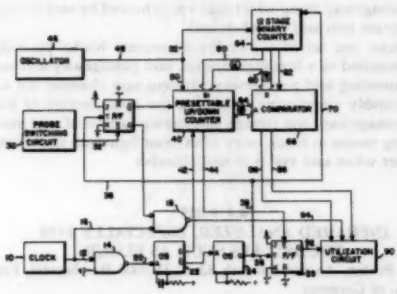
third conveyance means for conveying the bank notes for withdrawal collected in said second temporary collecting section for withdrawal to said cash outlet; and

transfer means for transferring the deposited bank notes collected for depositing in said first temporary collecting sections to said bank note storage chambers of said safe sections in which bank notes for withdrawal of the same denominations as those of said deposited bank notes are stored separately, whereby said deposited bank notes are used as bank notes for withdrawal.

4,479,050
SENSOR ALIGNMENT CIRCUIT AND METHOD OF OPERATION

David J. Helffrich, Nazareth, Pa., assignor to Bell and Howell Company, Phillipsburg, N.J.

Filed Dec. 28, 1981, Ser. No. 334,761
Int. Cl.³ G06K *7/016*
U.S. Cl. 235—474 **18 Claims**



1. Apparatus for providing and indication of the relative positioning of sensing means with respect to sensed indicia borne by articles traveling proximate said sensing means, said apparatus comprising:

first clock means for generating first clock pulses;

means for determining when said indicia is sensed by said sensing means;

second clock means for generating second clock pulses at a frequency f_2 and a period t_2, where frequency f_2 is greater than the frequency f_1 of said first clock, and where t_2 is less than the period t_1 of said first clock;

means for counting the number of second clock pulses generated during the period t_1 for generating a first signal in accordance therewith;

means for determining the number of second clock pulses generated before said indicia is sensed relative to the number of second clock pulses generated after said indicia is sensed, said means being adapted to provide a second signal related to said determination;

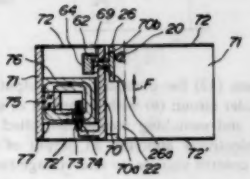
comparison means for comparing said second signal provided by said determining means with said first signal generated by said counting means; and,

means connected to said comparison means for providing an indication whether the sensing of said indicia occurs at an acceptable time between successive first clock pulses in order for said sensing means to be properly positioned with respect to said articles.

4,479,051
APPARATUS FOR DRIVING OBJECTIVE LENS IN TRACKING DIRECTION

Toru Musha, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 14, 1980, Ser. No. 139,756
Claims priority, application Japan, Apr. 27, 1979, 54-52236; Dec. 28, 1979, 54-170247; Feb. 16, 1980, 55-17208
Int. Cl.³ G05B *1/00*
U.S. Cl. 250—202 **98 Claims**



1. An apparatus for driving an objective lens for correcting a relative positional error, i.e., a tracking error between an information track recorded spirally or concentrically on a record medium and a light spot projected onto the record medium by means of the objective lens comprising

means for supporting the objective lens movably in a tracking direction perpendicular to an optical axis of the objective lens as well as to the information track;

a movable member made of magnetic material and arranged movably in the tracking direction in conjunction with the objective lens;

first and second magnetic members made of magnetic material and arranged in such a manner that the movable member is interposed therebetween via gaps viewed in a direction substantially perpendicular to the tracking direction to form together with the movable member a magnetic circuit passing through the first magnetic member, the gap between the first magnetic member and movable member, the movable member, the gap between the movable member and second magnetic member, and the second magnetic member;

means arranged in part of the magnetic circuit for producing a constant magnetic flux through the magnetic circuit; and

first and second coils would on the first and second magnetic members, respectively, at portions opposite to the movable member for producing a magnetic flux in the first and second magnetic member portions substantially in parallel with the tracking direction; whereby said first and second coils are supplied with signals corresponding to a tracking error signal representing the tracking error so as to move the movable member and thus the objective lens in the tracking direction.

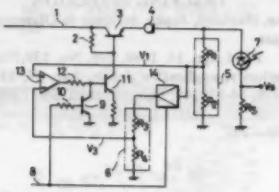
4,479,052
AVALANCHE PHOTO-DIODE BIAS CIRCUIT

Shinichi Suzuki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,079
Claims priority, application Japan, Aug. 31, 1981, 56-136658
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 R **5 Claims**

1. An avalanche photo-diode bias circuit for a light receiving device having light-receiving and pause times and an avalanche photo-diode employed as a light receiving element, comprising: a voltage-controlled transistor (3) connected through constant current means (4) to said avalanche photo-

diode; a first voltage divider circuit (5) connected to said constant current means (4); a sample/hold circuit (14) controlled by a sample pulse during a pause time for receiving an output of said voltage divider circuit (5); a second voltage divider circuit (6) connected to an output of said sample/hold



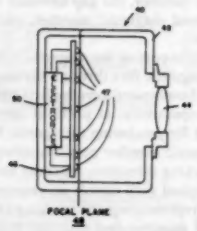
circuit; means (13) for comparing an output of said second voltage divider circuit (6) with an output of said first voltage divider (5); and switching means controlled by said sample pulse for selectively applying an output of said comparing means, as a control voltage, to said voltage-controlled transistor (3).

4,479,053

FOCAL PLANE ARRAY OPTICAL PROXIMITY SENSOR

Alan R. Johnston, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,797
Int. Cl.³ G01S 9/02
U.S. Cl. 250—221 **13 Claims**



1. In an optical proximity sensor mounted on a vehicle, the combination of

an illuminator assembly comprising an illuminator lens and an array of light emitters in the focal plane of said illuminator lens;

a detector assembly comprising a detector lens and an array of light detectors in the focal plane of said detectors lens; and

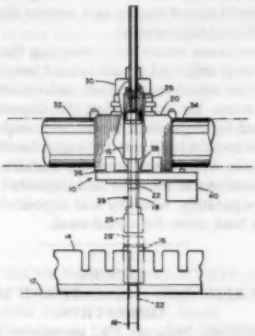
means for so positioning said detector assembly and said illuminator assembly with respect to each other on said vehicle that the field of view of each of said light emitters through said illuminator lens will intersect the field of view of at least one of said light detectors through said detector lens.

4,479,054

SCINTILLATION COUNTER LIGHT SEAL

Richard S. Kampf, Costa Mesa, Calif., and Henry G. Dowling, Atlanta, Ga., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 7, 1981, Ser. No. 328,341
Int. Cl.³ G01T 7/08
U.S. Cl. 250—328 **11 Claims**



1. A measuring apparatus for determining the constituents in a sample containing vial, said apparatus comprising:

a measuring chamber;

means for moving said vial into said chamber;

a passageway along which said vial is moved by said moving means into said chamber; and

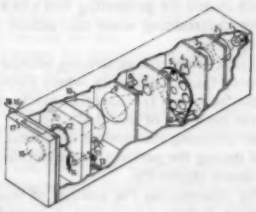
at least one set of a plurality of arcuate blades pivotally mounted in a housing adjacent said passageway and surrounding said passageway adjacent said chamber for adjustably contracting to reduce the cross section of said passageway, and engage an exterior surface of said moving means to block entry of exterior light into said chamber when said vial is in said chamber.

4,479,055

INFRARED ANALYZER, ESPECIALLY FOR FOODSTUFFS SUCH AS FLOUR

Peter Perten, An der Barsbek 33 B, D-2000 Barsbeuttel, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,151
Claims priority, application Sweden, Mar. 16, 1981, 8101655
Int. Cl.³ G01N 21/35, 21/11
U.S. Cl. 250—338 **9 Claims**



1. Infrared analyzer for relative determination of amounts of certain substances in a sample, especially in foodstuffs such as flour, by alternately irradiating the sample and a reference with infrared light, said analyzer comprising:

a light source;

means for separating infrared light from said light source;

means for transmitting the infrared light to a sample container for reflection by the sample;

reference means for providing a reference standard reflectance;

means for alternately receiving light reflected from the sample and from said reference means and converting the reflected light to electrical signals;

a container for the sample, said container including a light transmitting window and a first wall portion around the window, a second wall portion spaced from and movable relative to said first wall portion to define a suitable space for the sample between the window and said second wall, said container having an opening for receiving the sample in such a position that the sample can only be inserted into the space approximately parallel to the plane of the window.

4,479,056

MOTION DETECTOR FOR SPACE SURVEILLANCE

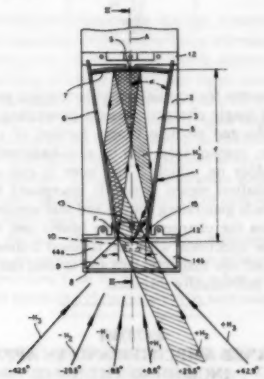
Hermann Zierhut, Munich, Fed. Rep. of Germany, assignor to Richard Hirschmann Radiotechnisches Werk, Esslingen am Neckar, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,079

Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119720

Int. Cl.³ G01J *5/08*

U.S. Cl. 250—342 **13 Claims**



1. A motion detector responsive to incident radiation, comprising:

an elongate four-sided frustopyramidal box with a first pair of longitudinal walls bisected by a plane of symmetry and a second pair of longitudinal walls converging toward said plane of symmetry from a wider closed end toward a narrower entrance and accessible to incident radiation, at least the walls of said second pair having reflective inner surfaces;

a concave radiation reflector at said closed end with a vertex in said plane of symmetry and a focus near said entrance end; and

radiation-sensing means in the vicinity of said focus confronting said concave reflector for illumination by incident beams of parallel rays approaching said entrance end at a plurality of predetermined azimuthal angles with reference to said plane of symmetry and reflected at least once in said box by a wall of said second pair, said radiation-sensing means having a receiving area substantially narrower than said entrance end at least in a direction perpendicular to said plane of symmetry, the length of said box being so related to the angle of convergence $\propto$ included between said second pair of walls and said plane of symmetry that incoming beams traversing said entrance end at azimuthal angles $\pm(2n+1)\text{-}\alpha$ undergo n reflections at said second pair of walls before reaching said concave reflector, n being an integer ranging from 0 to a maximum of 3, said incoming beams being converted by said concave reflector into converging beams undergoing each a further reflection at said second pair of walls before impinging from different directions onto said radiation-sensing means.

4,479,057

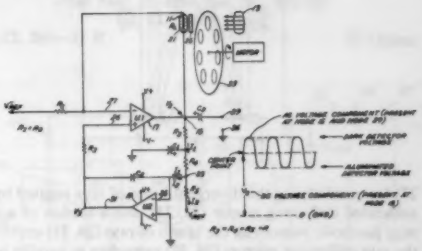
AUTOMATIC BIASING CONTROL CIRCUIT FOR EMISSIONS DETECTOR

Ihor B. Karpowycz, Chicago, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.

Filed Sep. 27, 1982, Ser. No. 424,082

Int. Cl.³ G01N *21/35*

U.S. Cl. 250—343 **7 Claims**



1. For use in an automotive exhaust emissions analyzer, an automatic bias control circuit for a radiant energy detector, comprising:

radiant energy detector means responsive to radiant energy for generating a signal output having a first signal characteristic varying in time in accordance with the amount of radiant energy detected by said radiant energy detector means, said detector means being driven by an electrical signal having a second signal characteristic;

signal source means for connection to said radiant energy detector means for generating said electrical signal having said second signal characteristic, said signal source means monitoring a developed signal for adjusting the magnitude of said second signal characteristic; and

automatic adjustment means for monitoring said first signal characteristic for generating said developed signal.

4,479,058

AUXILIARY UNIT FOR CARRYING OUT REFLECTION MEASUREMENTS USING AN IR SPECTROMETER

Jürgen Gast, Rheinstetten; Lutz Wunsch, Vökersbach, and Günter Zachmann, Remchingen, all of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 426,221

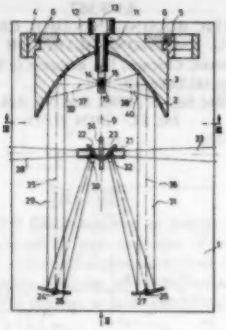
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147689

Int. Cl.³ G01J *5/08*

U.S. Cl. 250—343 **10 Claims**

1. An auxiliary device for carrying out reflection measurements using an IR spectrometer designed for the performance of transmission measurements and comprising optical means for generating a beam of rays focussed in a cross-sectional plane located within a straight section and intended to receive the sample to be investigated by transmission, which auxiliary device comprises two deflecting mirrors to be positioned in the straight beam section on both sides of the cross-sectional plane and further two focussing reflector arrangements of which the first forms at the location of the sample to be investigated a reduced image of the focus situated within the beam of rays deflected by the said first deflecting mirror, while the said second focussing reflector arrangement forms an enlarged

image of the said reduced focus at a distance before the said second deflecting mirror so that the beam of rays emitted by the said second deflecting mirror forms the prolongation of the beam of rays inciding upon the said first deflecting mirror just as if the auxiliary device did not exist, characterized in that each reflector arrangement comprises a collimator mirror (26, 27) for parallelizing the divergent beam of rays emitted by the associated deflecting mirror (22, 23), and a section of a common parabolic mirror (2), the beams of rays (29, 31) emitted by the said collimator mirrors (26, 27) extending in parallel to the axis (9) of the said parabolic mirror (2) and the sample (16) being arranged at a point coinciding with its focal point (14).

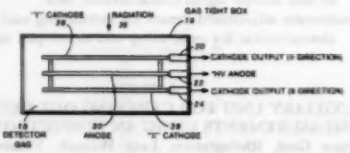


4,479,059

IMAGING RADIATION DETECTOR WITH GAIN

Christopher L. Morris; George C. Idzorek, both of Los Alamos, and Leroy G. Atencio, Espanola, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 21, 1982, Ser. No. 400,545
Int. Cl.³ G01T 1/18
U.S. Cl. 250—385 **6 Claims**



1. A two-dimensional integrating radiation detector for having high resolution and gain comprising:

a detector gas;

charge carriers generated by the interaction of said radiation with said detector gas;

anode means biased at a predetermined positive potential sufficient to cause cumulative multiplication of said charge carriers for enhancing detector gain, said anode means having a plurality of parallel wires equally spaced apart at a close fixed distance;

two-dimensional cathode means for accumulating a positive charge from positive ions generated by said cumulative multiplication of charge carriers, said two-dimensional cathode means having a first and a second plurality of parallel wires that are equally spaced apart at one-half the distance of said close fixed distance of said plurality of wires of said anode means, said first and said second plurality of parallel wires of said cathode means being orthogonally disposed; and

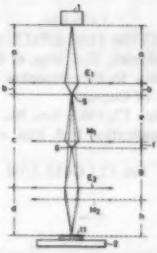
means for sampling said positive charge accumulated on said two-dimensional cathode means to obtain a two-dimensional intensity distribution of said radiation.

4,479,060

APPARATUS FOR IRRADIATION WITH CHARGED PARTICLE BEAMS

Hifumi Tamura, Hachioji; Tohru Ishitani, Sayama, and Akira Shimase, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,027
Claims priority, application Japan, Jan. 22, 1982, 57-6379[U]
Int. Cl.³ H01J 3/14; G01N 23/04, 23/225
U.S. Cl. 250—398 **2 Claims**



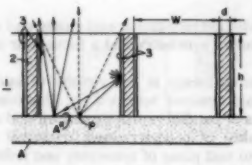
1. An apparatus for irradiation with charged particle beams, comprising a single charged particle generating source from which the charged particle beams formed of electrons and negative ions, respectively, can be simultaneously derived; a specimen holder on which a specimen is put; and charged particle irradiation means which is interposed between said charged particle generating source and said specimen holder in order to focus the charged particle beams and to irradiate a surface of the specimen with the focused beams, and which includes at least one magnetic lens and at least one electrostatic lens that are individually disposed.

4,479,061

LUMINANCE AMPLIFIER AND AN APPARATUS INCLUDING THE SAME

Yuichiro Koizumi, and Toshie Kaneko, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 283,912, Jul. 16, 1981, abandoned. This application Mar. 15, 1984, Ser. No. 589,057
Claims priority, application Japan, Jul. 25, 1980, 55-101913; Feb. 27, 1981, 56-27755; Feb. 27, 1981, 56-27756
Int. Cl.³ H01J 1/62
U.S. Cl. 250—487.1 **21 Claims**



1. A luminance amplifying apparatus comprising:

irradiating means for radiating through a luminant surface to the outside, wherein the luminant surface reflects radiation incident thereon from the outside; and

a grating disposed adjacent to the luminant surface and outside said irradiating means and including a plurality of walls which reflect and diffuse radiation and which define apertures;

whereby radiation emitted by said irradiating means is reflected by said walls and by the luminant surface so as to increase the luminance along the normal to the luminant surface.

4,479,062

PHOTO-ELECTRIC CONVERSION DEVICE WITH ACCUMULATION TIME CONTROL

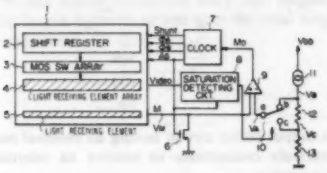
Masahiro Kawasaki; Harumi Aoki, and Koji Suzuki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 345,122

Claims priority, application Japan, Feb. 6, 1981, 55-16355; Feb. 6, 1981, 55-16356

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—578 **5 Claims**



1. A photo-electric conversion device, comprising: a light receiving element array for accumulating information on incident light through an accumulation effect; means for scanning the light receiving element array; and light receiving means provided adjacent said light receiving element array and providing an output in response to received light, said output from the light receiving means being utilized to control an accumulation time of said light receiving element array,

said device further comprising saturation detecting means for detecting saturation of an output of said light receiving element array; and

means for further varying said accumulation time in response to an output of said saturation detecting means;

said accumulation time being reduced when said output of said light receiving element array is saturated.

4,479,063

AUTOMATIC ENGINE STOP-RESTART SYSTEM

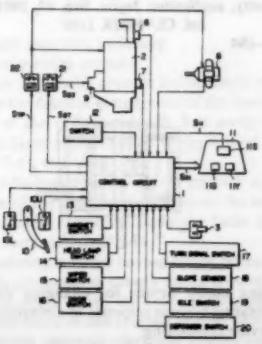
Masahiro Ueda; Masahiko Noba; Osamu Hori; Kimitoshi Murata, and Hatsuo Nakao, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 2, 1982, Ser. No. 394,727

Claims priority, application Japan, Jul. 27, 1981, 56-117252

Int. Cl.³ F02N *11/00*; H02P *1/04, 5/16*

U.S. Cl. 290—30 R **3 Claims**



1. An automatic engine stop-restart system, comprising:

engine stop and restart means for automatically stopping an engine under a first predetermined condition and automatically restarting said engine under a second predetermined condition;

a two-speed type wiper motor having a low terminal and a high terminal, for driving a wiper; and

control means connected to only one of said low terminal and said high terminal of said wiper motor, for judging an operation condition of said wiper in accordance with a signal from the connected terminal of said wiper motor and preventing said engine from being automatically stopped when said wiper is driven.

4,479,064

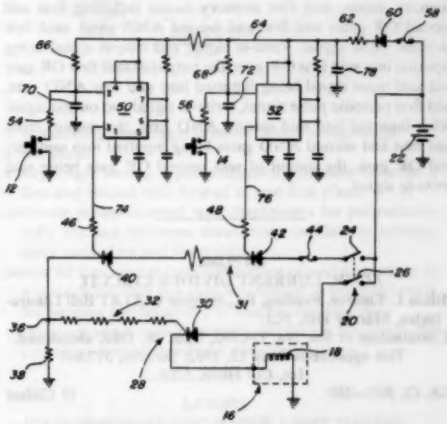
SAFE START SYSTEM FOR AUTOMOTIVE VEHICLES

Dee N. Monsen, 2312 Sunset, Caldwell, Id. 83605

Filed Mar. 31, 1983, Ser. No. 480,764

Int. Cl.³ B60R *25/04*

U.S. Cl. 290—37 R **11 Claims**



1. In combination with an automotive vehicle having a body, a source of electrical energy, an engine and an engine starting circuit including a starter solenoid and an ignition switch connected to the electrical voltage source, a safe start system comprising a plurality of switch devices mounted on the body of the vehicle for actuation externally of the vehicle, signal controlled means connected to the starting circuit for normally preventing operation of the engine, and timing means connected to said switch devices and the signal controlled means for enabling the starting circuit through the signal controlled means in response to sequential actuation of said switch devices within a predetermined interval of time.

4,479,065

CHATTERING PREVENTIVE CIRCUIT

Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,431

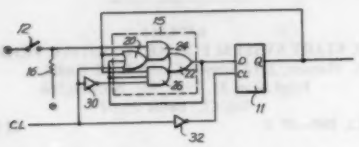
Claims priority, application Japan, May 28, 1981, 56-81369

Int. Cl.³ H03K *17/56*

U.S. Cl. 307—247 R **9 Claims**

1. A chattering preventive circuit comprising switch means for producing an input signal representative of the open and closed states of said switch means, first and second periodic pulse signals, first memory means for receiving said input signal and said first periodic pulse signal and for producing a write-in signal representative of the coincidence of said input signal and said first periodic pulse signal, second memory means for receiving said write-in signal and said second peri-

odic pulse signal, said second memory means producing an output signal representative of the closed state of said switch means only when said switch means is kept closed for at least a predetermined time period, said second memory means not producing the next output signal representative of another closing of said switch means unless said switch means first remains open for at least a predetermined time period, said first memory means receiving said output signal from said second memory means as an input, said write-in signal produced by said first memory means being applied as an input to said first



memory means, said first memory means including first and second OR gates and first and second AND gates, said first periodic pulse signal, write-in signal and output signal being inputted into said first OR gate, the output of said first OR gate and said input signal being inputted into said first AND gate, said first periodic pulse signal, write-in signal and output signal being inputted into said second AND gate, the outputs from said first and second AND gates being inputted into said second OR gate, the output of said second OR gate being said write-in signal.

4,479,066

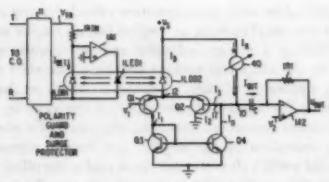
AC/DC CURRENT DIVIDER CIRCUIT

Milton L. Embree, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 134,992, Mar. 28, 1980, abandoned. This application May 13, 1982, Ser. No. 377,867

Int. Cl.³ H03K *5/00*

U.S. Cl. 307—350 **10 Claims**



1. A circuit having an output terminal and an input terminal for accepting an input current having an AC component and a DC component, said circuit comprising

means for separating said input current into first and second currents in a controlled proportion, each of said first and second currents having an AC component and a DC component,

means responsive to said first current for establishing a control current substantially equal to said first current, said control current having an AC component and a DC component,

a source of a DC reference current,

said separating means including means responsive to said DC reference current and to said control current for controlling said proportion such that the DC component of said control current is substantially equal to said DC reference current, and

means for supplying at said output terminal a signal representing the AC component of said control current.

4,479,067

OUTPUT BUFFER CIRCUIT

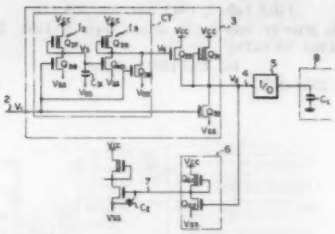
Kouichi Fujita, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 26, 1981, Ser. No. 296,311

Claims priority, application Japan, Aug. 29, 1980, 55-119360

Int. Cl.³ H03K *17/04, 19/017, 17/693*

U.S. Cl. 307—475 **15 Claims**



14. An output buffer circuit having an external output line and operatively connectable to receive an internal output signal, comprising:

a buffer circuit operatively connected to the external output line and operatively connectable to receive the internal output signal; and

means, operatively connected to the external output line and operatively connectable to receive the internal output signal, for charging the external output line for a predetermined time period in dependence upon the internal output signal, said means for charging comprising:

a charging circuit operatively connected to the external output line;

a circuit, operatively connected to said charging circuit, for activating said charging circuit in dependence upon the internal output signal; and

a delay circuit, operatively connected to said charging circuit, for deactivating said charging circuit in dependence upon the internal output signal.

4,479,068

STEPPING MOTOR DEVICE FOR CHANGING THE POSITION OF A ROTATING BODY

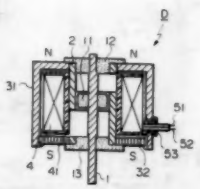
Takaharu Idogaki; Hisasi Kawai, both of Aichi; Kyo Hattori, and Kazuhiro Sakurai, both of Shizuoka, all of Japan, assignors to Nippan Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 15, 1982, Ser. No. 418,528

Claims priority, application Japan, Sep. 19, 1981, 56-147002

Int. Cl.³ H02K *1/06*

U.S. Cl. 310—194 **6 Claims**



1. A stepping motor device for changing the rotational position of a rotating body in response to a command electrical signal, said device comprising:

a bobbin having a central cylindrical cavity,

a coil wound on said bobbin,

a stator inserted in said central cylindrical cavity of the bobbin,

said stator consisting of a hollow cylindrical body having first recesses formed in the upper and the lower portions, respectively, one of said first recesses in the upper portion being located in the side opposite to the side of the other of said first recesses in the lower portion with respect to the axis of said hollow cylindrical body, the portion of said hollow cylindrical body between said first and second recesses being a main cylinder having a circumferential structure, second recesses formed symmetrically of said main cylinder for providing a predetermined distribution of the lines of magnetic force in the space of said hollow cylindrical body, and third recesses formed symmetrically in the middle portion of said hollow cylindrical body for changing the magnetically stable position, and

a cylindrical permanent magnet rotor arranged at the center of the space in said hollow cylindrical body, said magnet having an axial length equal to or less than the axial length of said main cylinder.

4,479,069

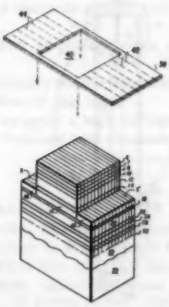
LEAD ATTACHMENT FOR AN ACOUSTIC TRANSDUCER

David G. Miller, Boxford, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 12, 1981, Ser. No. 320,377

Int. Cl.³ H01L *41/22*

U.S. Cl. 310—334 **3 Claims**



1. A transducer assembly including

a first array of parallel crystals,

a second array of parallel crystals having faces respectively adhered to the faces of the crystals of the first array with the faces of the crystals of said first array protruding beyond the faces of the crystals of the second array so as to form at least one shelf,

electrical conductors respectively in contact with the adhered faces of the crystals of each array, the said conductors respectively extending along the faces of said first array that form said shelf, and

a sheet of insulating material having means defining an opening therein, said opening closely fitting around the second array at the point where the faces of its crystals are adhered to the faces of the crystals of said first array, said sheet carrying separate electrical conductors that are respectively in contact with the electrical conductors on the faces of the crystals of said first array that form said shelf.

4,479,070

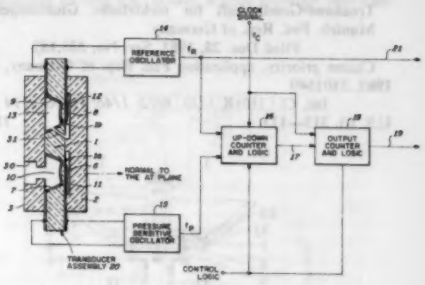
VIBRATING QUARTZ DIAPHRAGM PRESSURE SENSOR

Richard H. Frische; Rudolf C. Dankwort, and Charles D. Klem, all of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,004

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—338 **24 Claims**



1. A vibrating diaphragm pressure sensor comprising

a first plate,

a diaphragm having a predetermined thickness between a first and second wall formed in said first plate,

electrode means coupled with diaphragms for piezoelectrically exciting thickness shear mode oscillations substantially normal to said diaphragm,

means for exposing at least one surface of said diaphragm to a variable pressure in a direction normal to said diaphragm for varying the frequency of said oscillations, and

means responsive to said variable oscillation frequency for providing a measure of said variable pressure.

4,479,071

HIGH-PRESSURE DISCHARGE LAMP HAVING SHIELDING MEANS COMPRISED OF BORON NITRIDE

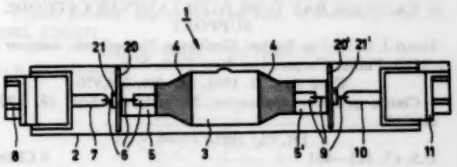
Germain R. T'Jampens, and Abraham Coomans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,441

Claims priority, application Netherlands, Apr. 8, 1981, 8101723

Int. Cl.³ H01J *61/04, 61/52*

U.S. Cl. 313—25 **9 Claims**



1. A high-pressure metal halide lamp having a discharge vessel surrounded by an outer envelope, said discharge vessel has an ionizable filling comprising at least an alkali metal and a halogen and is provided with two electrodes between which in the operating condition of said lamp the discharge takes place, at least one electrode being connected to a current supply conductor extending between said discharge vessel and said outer envelope, a plate-shaped element being present in said lamp between said discharge vessel and said outer envelope in such manner that, when viewed from said discharge vessel, said current supply conductor is present substantially entirely

behind said plate-shaped element, characterized in that said plate-shaped element comprises boron nitride.

4,479,072

SEALED-BEAM HEADLAMP HAVING SEATING ABUTMENT ON THE OUTSIDE OF CONCAVE REFLECTOR

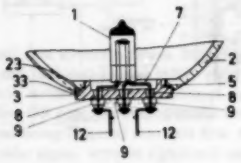
Manfred Gaugel, Fürstenfeldbruck, and Walter Schönherr, Giengen, both of Fed. Rep. of Germany, assignors to Patent Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Dec. 28, 1981, Ser. No. 335,187

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 3101640

Int. Cl.³ H01K *1/28, 3/12, 1/46;* H01G *1/14*

U.S. Cl. 313—113 **11 Claims**



1. Sealed-beam headlamp having

an electric lamp (1) and a concave reflector (2), formed at its base with a seating abutment, and having a reflective surface at the inner, or concave side thereof,

a lamp carrier element (3, 4) having a seating surface (45) fitting against the seating abutment on the reflector (2),

the lamp (1) being secured to the carrier element in predetermined aligned position with respect to said seating surface;

and wherein the abutment defines a locating surface (25) on the reflector, is located at the concave side, and hence adjacent the reflective surface of the reflector, and at a predetermined position with respect to the reflector to position the lamp in aligned predetermined relationship with respect to the reflective surface of the reflector upon assembly of the carrier element to the reflector with the seating surface (45) on the lamp carrier element fitting against the locating surface (25) formed by the abutment on the reflector at the inner region of the concave reflector.

4,479,073

CATHODE RAY TUBE WITH LAMINAR CATHODE SUPPORT

Henri J. G. M. Van Daelen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 21, 1981, Ser. No. 294,970

Claims priority, application Netherlands, Sep. 19, 1980, 8005230

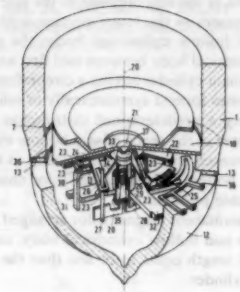
Int. Cl.³ H01J *29/46, 9/18*

U.S. Cl. 313—451 **6 Claims**

1. A cathode ray tube comprising an evacuated glass envelope containing a target and an electron gun for producing an electron beam directed at the target, said electron gun including an electrode and a cathode comprising a hollow cathode shaft and a filament extending into the shaft, said cathode being secured to the electrode by means of a cathode support comprising a plurality of spaced-apart metal lamellae secured to each other by means of electrical insulators, said lamellae including:

(a) a first lamella electrically-connected to the electrode;

(b) second and third lamellae secured to the first lamella, said second and third lamellae each spaced from the first lamella by substantially the same distance, each electrically-insulated from the other, and each electrically-connected to a respective lead of the cathode filament; and



(c) a fourth lamella secured to and substantially equally spaced from the second and third lamellae, said fourth lamella being attached to the cathode shaft for supporting said shaft within the envelope.

4,479,074

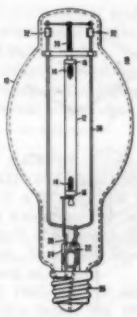
HIGH INTENSITY VAPOR DISCHARGE LAMP WITH SINTERING AIDS FOR ELECTRODE EMISSION MATERIALS

Ranbir S. Bhalla, Pine Brook, N.J., assignor to North American Philips Lighting Corp., New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,274

Int. Cl.³ H01J *61/073*

U.S. Cl. 313—628 **6 Claims**



1. In combination with a high intensity vapor discharge lamp comprising a radiation transmitting arc tube having electrodes operatively supported therein proximate the ends thereof and adapted to have an elongated arc discharge maintained therebetween, and means for connecting said electrodes to an energizing power source, the improved structure for said electrodes each of which comprises:

an elongated refractory metal member having one end portion thereof supported proximate an end of said arc tube and the other end portion of said metal member projecting a short distance inwardly within said arc tube, an overfitting refractory metal coil means carried on the inwardly projecting portion of said elongated metal member;

a sintered electron emissive material carried intermediate turns of said overfitting coil means, said electron emissive material selected from one of the group consisting of $Ba_2CaM''O_6$, $M_3M'_2M''O_9$, and $Ba_3CaM'''_2O_9$ where: M is an alkaline earth metal and at least principally comprises barium; M' is yttrium, a lanthanide series rare earth metal,

or any mixture thereof; M'' is tungsten, molybdenum, or mixtures thereof; and M''' is niobium, tantalum, or mixtures thereof; and

a predetermined percentage of sintering aid intermixed with said electron emissive material, said sintering aid comprising Nb_2O_5 or Ta_2O_5 or a mixture thereof along with at least one alkaline earth oxide of the group consisting of CaO, BaO, and SrO, wherein said electron emissive material and said sintering aid are present in amounts of from about 2 and 15 weight percent sintering aid and from about 98 and 85 weight percent electron emissive material and said alkaline earth oxide constitutes from about 5 to 55 mole percent of said sintering aid material.

4,479,075

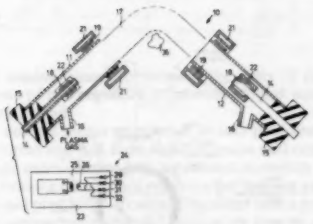
CAPACITATIVELY COUPLED PLASMA DEVICE

William G. Elliott, 60 Baker Bridge Rd., Lincoln, Mass. 01773

Filed Dec. 3, 1981, Ser. No. 327,031

Int. Cl.³ H01J 7/24; H05B 31/26

U.S. Cl. 315—111.21 **13 Claims**



1. A capacitatively coupled plasma jet device comprising at least one tube of electrically insulating material,

a cylindrical electrode outside and substantially surrounding said tube,

means to flow an ionizable gas tangentially through said tube,

a solid electrically conducting sample positioned adjacent to the gas flow of said tube,

and means to apply a high voltage, high frequency electric potential between said electrode and said sample.

4,479,076

POWER SAVING DEVICE FOR ELECTRONIC FLASH

Tetsuo Yamaoka, Osaka, and Hiroshi Iwata, Nara, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Oct. 15, 1981, Ser. No. 311,611

Claims priority, application Japan, Oct. 15, 1980, 55-145017; Feb. 27, 1981, 56-29156; Feb. 27, 1981, 56-29157

Int. Cl.³ H05B 41/32

U.S. Cl. 315—241 P **5 Claims**

1. A power saving device for an electronic flash of the type having a DC power source (1) a DC-DC converter (2) comprising an oscillation transformer, an oscillation transistor and a rectifying diode for converting a low voltage supplied from said DC power source into a high DC voltage, a main discharge capacitor (6) which is charged with a high DC voltage supplied from said DC-DC converter, a flash lamp (7) which flashes by consuming the energy stored in said main discharge capacitor, and a trigger circuit (8) for causing said flash lamp to flash, said device comprising:

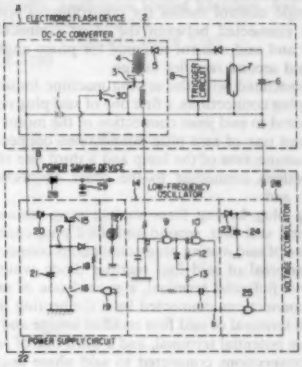
a first electronic switching element (15) series connected in a power supply circuit (22) source to said oscillation transistor in said DC-DC converter;

a normally open start switch (16) which, when closed, causes said first electronic switching element (15) to conduct;

a timer circuit (14) having a timing capacitor (11) and which is energized in response to the conduction of said first electronic switching element (15) so as to charge said timing capacitor (11) with energy supplied from said power source via said power supply circuit (22) said timing capacitor (11) being charged through a path separate from said oscillation transistor (3);

a first switching circuit (19), responsive to an output signal generated when the voltage charged across said timing capacitor (11) reaches a predetermined value, for turning off said first electronic switching element (15);

a voltage accumulator means (26) which is adapted to be connected to said DC power source through said elec-



tronic switching element (15) when said start switch (16) is closed,

said voltage accumulator means (26) including a second switching circuit (25) whose output is changed when the voltage charged across said timing capacitor (11) of said timer circuit (14) reaches a predetermined value; and

a control switching element (30) which is turned on in response to the change of the output from said second switching circuit (25) so that said oscillation transistor (3) is rendered non-conductive.

4,479,077

SEWING MACHINE WITH A UNIVERSAL MOTOR

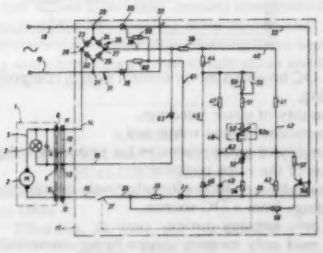
Patrice J. Kemmel, Stutensee, and Jürgen Hartwig, Karlsruhe-Durlach, both of Fed. Rep. of Germany, assignors to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,269

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234171

Int. Cl.³ H02P 7/36; H02K 23/64

U.S. Cl. 318—245 **8 Claims**



1. A circuit arrangement for a sewing machine having a housing, a motor with a pair of connections and a lamp with a

pair of connections, with one connection of the motor and lamp joined together to form a joint connection, comprising:

a pair of power supply lines for receiving electrical power;

a first rectifier bridge comprising a plurality of diodes connected to said power supply lines and having a first terminal connected to said joint connection and a second terminal connected to the other connection of the lamp;

a second rectifier bridge comprising a portion of said first rectifier bridge with one of said first and second terminals, and at least one additional semiconductor device with a third terminal and a control terminal, said second rectifier bridge connected to said power supply lines and said third terminal connected to the other connection of the motor;

phase angle control means for controlling a speed of the motor connected between the other connection of the motor and said control terminal for phase angle controlling said second rectifier bridge;

a plug associated with the sewing machine housing having three plug connections, a first one of said plug connections connected to said joint connection of the motor and lamp, a second one of said plug connections connected to the other connection of the lamp and a third one of said plug connections connected to the other connection of the motor; and

a mating plug having three mating plug connections for engaging said first, second and third plug connections, a first one of said mating plug connections connected to said first terminal of said first rectifier diode which forms a negative potential terminal, a second one of said mating plug connections connected by a connecting line to said second terminal of said first rectifier bridge and forming a positive potential terminal, and a third one of said mating plug connections connected to said phase angle control means and said third terminal of said second rectifier bridge forming a positive potential terminal of said second rectifier bridge.

4,479,078

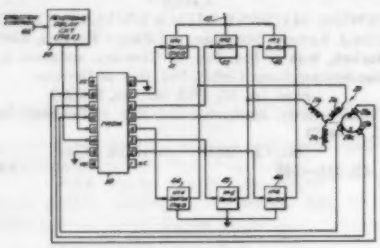
BRUSHLESS MOTOR CONTROLLER

H. Keith Kidd, Christianburg, and Philip S. Coulon, Jr., Radford, both of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 161,579, Jun. 20, 1980,. This application Jul. 13, 1981, Ser. No. 282,796

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—254 **10 Claims**



1. A DC brushless motor control system comprising a motor including,

a plurality of stator windings,

a permanent magnet rotor, and

a plurality of position sensors for providing a digital indication of the rotor position;

solid state drive switches for selectively energizing said stator windings from a DC source;

a read only memory device,

said read only memory device being connected to receive said digital indications from said position sensors as memory addresses,

said read only memory device being programmed to provide data output sets in response to said addresses for activating selected ones of said drive switches, and

said data output sets from said read only memory device being connected to control the states of said drive switches so that at least two of said drive switches are rendered conductive at each active motor drive data output set;

said read only memory device being further connected to receive a control signal at an additional address input and wherein

said read only memory device is programmed to render all of said drive switches nonconductive when said control signal is present.

4,479,079

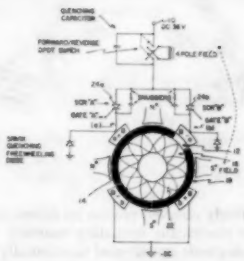
APPARATUS FOR VARYING THE SPEED OF DC MOTORS

John C. Hanner, 407 Transylvania Ave., Raleigh, N.C. 27609

Filed Oct. 21, 1983, Ser. No. 544,255

Int. Cl.³ H02P *7/28*

U.S. Cl. 318—345 G **5 Claims**



1. In an electric motor of the type having an armature with the rotor windings thereof electrically connected to a commutator, a set of brushes for applying current to the commutator segments, and the entire motor powered by a source of DC voltage, the improvement whereby:

a. said commutator includes one dead commutator segment having a peripheral width dimension at least as great as the corresponding dimension of one of said brushes whereby as the dead segment leaves a brush, current is interrupted;

b. electronic switching means in the electrical circuit between said source and said commutator for maintaining said current interruption from the DC voltage source to the brushes until reactivation of said switching means; and

c. gating means for reactivating said electronic switching means after a variable predetermined time lag whereby the speed of said electric motor may be varied without a constant drain of power from the source of DC voltage.

4,479,080

ELECTRICAL BRAKING CONTROL FOR DC MOTORS

Joe C. Lambert, Charlottesville, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Apr. 25, 1983, Ser. No. 488,091

Int. Cl.³ H02P *3/14*

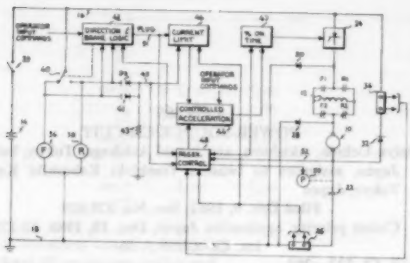
U.S. Cl. 318—373 **9 Claims**

1. In a control system for a direct current traction motor having series connected field and armature windings, the control system being of the type including a regulator whose ratio of conduction to non-conduction periods determines the motor power, means for initiating electrical braking by reversing the polarity of current to the field winding, a current path for current generated in a plug braking mode of operation, a current path for current generated in a regenerative braking mode

of operation, and a set of contacts whose operational state is opened or closed depending on the braking mode, an electrical braking control circuit, comprising:

first control means causing braking current to flow in said plug braking path immediately upon initiation of electrical braking;

first sensing means for sensing the current in said plug braking path to provide a signal indicative of plug braking current;



second sensing means for sensing the ratio of on-time to off-time of said regulator to provide a signal indicative of said ratio; and

second control means responsive to said plug braking current signal and said ratio signal to cause said contactor to change states causing braking current to switch from said plug braking path to said regenerative braking path whenever said plug braking current is greater than a preselected plug current value and said ratio of on time to off time is less than a preselected value.

4,479,081

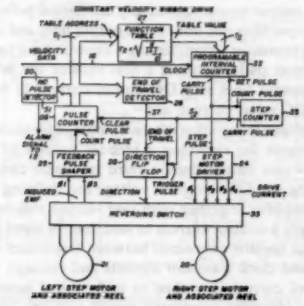
STEP MOTOR DRIVE

Samuel C. Harris, Waynesboro, Va., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 13, 1983, Ser. No. 494,350

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **15 Claims**



1. A tape transport comprising a supply spool and a takeup spool wherein the diameter of the tape being wound on the takeup spool increases as a function of the diameter of the tape being removed from the supply spool, means for transferring tape from the supply spool to the takeup spool at a constant speed comprising a first step and a second step motor, a programmable source of stepping pulses, one of said step motors responsive to said stepping pulses for moving the takeup spool, said other of said step motors responsive to supply spool motion for providing a train of pulses whose rate is proportional to the angular velocity of the supply spool, means for counting said provided train of pulses during a predetermined sample interval, and means responsive to the count of said provided train of pulses to program the occurrences of the stepping pulses provided by said programmable source of stepping pulses.

4,479,082

MOTOR CONTROL SYSTEM

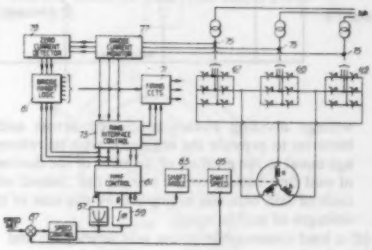
Colin D. Schauder, Warwickshire, and Roy Caddy, Leicestershire, both of England, assignors to The General Electric Company p.l.c., England

Filed Aug. 3, 1982, Ser. No. 404,720

Claims priority, application United Kingdom, Aug. 12, 1981, 8124625; Mar. 1, 1982, 8205942

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—799 **8 Claims**



1. A control system for controlling an induction motor,

(I) via the stator only, in dependence upon a control signal,

(II) said induction motor comprising:

(A) a stator

(a) provided with a plurality of phase windings

(b) fed with alternating current for generating a rotating m.m.f. and

(B) a rotor mounted within said stator for rotation under the influence of said rotating m.m.f.,

(C) said control system for controlling the induction motor via the stator only in dependence upon a control signal comprising:

(1) first control means responsive to said control signal for generating first and second demand signals representative of the desired amplitude of said current and of the desired accrued angle of slip of said m.m.f. relative to said rotor;

(2) second control means for resolving said first demand signal into orthogonal demand components proportional to the sine and cosine respectively of said desired accrued angle of slip;

(3) third control means for generating a rotor angle signal representative of the angular position of said rotor relative to said stator;

(4) forward transform means responsive to said rotor angle signal and to said orthogonal demand componnts to produce equivalent phase-winding drive signals; and

(5) means controlled by said phase winding drive signals for feeding said alternating current to said phase windings in a controlled manner.

4,479,083

DC POWER SYSTEM HAVING BATTERY VOLTAGE EQUALIZER CIRCUIT

James D. Sullivan, Grove City, Ohio, assignor to Vanner, Inc., Columbus, Ohio

Filed Sep. 30, 1982, Ser. No. 428,579

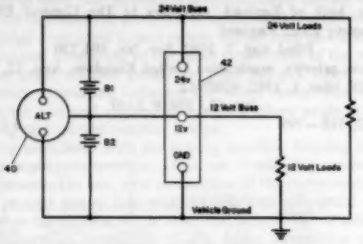
Int. Cl.³ H02J *7/00*

U.S. Cl. 320—6 **15 Claims**

1. An improved DC power network comprising:

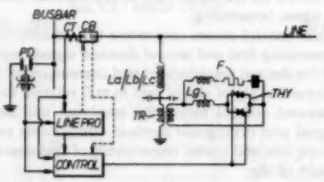
(a) a series connected pair of batteries;

(b) an electrical generator connected across said series pair;
(c) an equalizer circuit for equalizing the voltages of said batteries and comprising a regulated DC/DC converter for converting electrical energy to the voltage of a first one of said batteries from the sum of the voltages of said batteries, said converter having its input connected across said pair of batteries and its output connected to said first battery, the regulator circuit of said converter including a



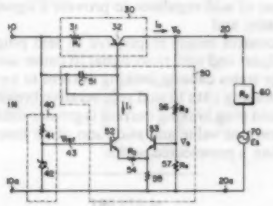
voltage dividing circuit connected across said pair of batteries to provide the regulator with its reference voltage equal to the product of the ratio of the desired voltage of said first battery to the sum of the desired voltages of each of said batteries multiplied by the sum of the actual voltages of said batteries;
(d) a load connectable across said series pair; and
(e) a load connectable across said first battery.

4,479,084
SECONDARY ARC EXTINCTION DEVICE
Yasuhiro Ogawa, Kamagaya, and Isao Fukui, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jul. 21, 1982, Ser. No. 400,584
Claims priority, application Japan, Jul. 30, 1981, 56-119762
Int. Cl.³ H02J *3/18*; G05F *1/70*
U.S. Cl. 323—210 **6 Claims**



1. A secondary arc extinction device in a 3-phase electrical power system comprising:
a bus bar;
a 3-phase electric power line connected to said bus bar;
protective relaying means connected to said bus bar which outputs a signal indicating a ground fault in said 3-phase power line;
a plurality of first reactance means one of said plurality of first reactance means being provided with each phase, one terminal of each of said first reactance means being connected to a respective electrical power phase;
a transformer having a primary winding and a secondary winding, said primary winding being connected between the other terminal of each of said first reactance means and ground;
second reactance means connected to said secondary winding of said transformer; and
means for controlling the reactance of said second reactance means in response to the output of said protective relaying means in order to extinguish the secondary arc occurring as a result of said ground fault by providing that the capacitance between the phases of said power line and the reactance between the phases of said power line resonate in parallel.

4,479,085
POWER SOURCE CIRCUIT
Seiya Uchida, Akishima, and koichi Ashikaga, Tokyo, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 9, 1981, Ser. No. 329,029
Claims priority, application Japan, Dec. 19, 1980, 55-178905
Int. Cl.³ G05F *1/56*
U.S. Cl. 323—280 **1 Claim**



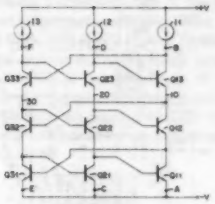
1. A power source circuit comprising:
input lines for receiving a DC input current;
reference voltage generating means provided across said input lines for generating a DC reference voltage;
output lines for applying a DC output current to a load;
current output means operatively connected between one of said input lines and one of said output lines and comprising a first transistor circuit having a control input terminal and a current path including a first resistor for providing at said output lines said DC output current in response to said DC input current; and
error voltage integration means comprising a second transistor circuit for receiving a breeder voltage of a voltage across said output lines, a third transistor circuit for receiving said DC reference voltage and defining a differential amplifier together with said second transistor circuit to apply a control current to said control input terminal, a second resistor connected between transistors of the second and third transistor circuits and through which the control current is applied to said control input terminal, and a capacitor connected across said one of the input lines and said control input terminal, said error voltage integration means operating so that a voltage proportional to a difference between said DC reference voltage and said breeder voltage at a required integration time constant operates to develop said control current, said required integration time constant being determined by said first resistor, said second resistor and said capacitor so that said output lines have a low output impedance in terms of direct current to maintain across said load a predetermined constant DC output voltage and a high output impedance with respect to an AC signal applied to said output lines.

4,479,086

TRANSISTOR CIRCUIT

Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 23, 1982, Ser. No. 422,097
Claims priority, application Japan, Sep. 24, 1981, 56-151273; Oct. 30, 1981, 56-173775
Int. Cl.³ G05F 3/16
U.S. Cl. 323—315 11 Claims



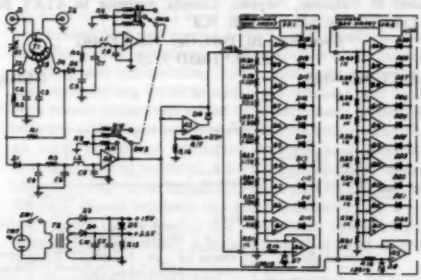
1. A transistor circuit comprising:
at least three current paths; and
sequentially-coupled transistor means including N transistors (N being the number of said current paths) with the collector-emitter paths thereof connected in series with said respective current paths, the base of an i-th transistor (i being a positive integer from 1 to N−1) being connected to the collector of the (i+1)-th transistor, the base of the N-th transistor being connected to the collector of the first transistor.

4,479,087

STANDING WAVE RATIO AND POWER METER

John E. Althouse, 1924F W. Mission Rd., Escondido, Calif. 92025

Filed Apr. 22, 1982, Ser. No. 370,770
Int. Cl.³ G01R 27/04
U.S. Cl. 324—58 B 10 Claims



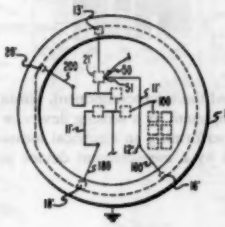
1. An apparatus for measuring the standing wave ratio of a signal on a transmission line between a radio frequency signal source and its load which comprises:
means for generating a first DC voltage signal proportional to the amplitude of the incident component of the transmitted power;
means for generating a second DC voltage signal proportional to the amplitude of the reflected component of the transmitted power;
means for indicating in discreet increments the relative amplitude of the second DC voltage signal in relation to the amplitude of the first DC voltage signal;
said means for indicating comprising:
a stack of voltage comparators, each of said comparators having an input receiving the second DC voltage signal;
a voltage divider chain to which is applied the first DC voltage signal;
said voltage divider chain providing a series of scaled reference points individually connected to the reference inputs of said comparators; and
means for displaying the output status of each of said voltage comparators.

4,479,088

WAFER INCLUDING TEST LEAD CONNECTED TO GROUND FOR TESTING NETWORKS THEREON

Herbert Stopper, Orchard Lake, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 16, 1981, Ser. No. 225,580
Int. Cl.³ G01R 31/02, 31/28; H01L 27/00
U.S. Cl. 324—73 R 4 Claims



1. A wafer having disposed thereon:
a plurality of integrated circuit chips having inputs and outputs;
a reticulate network formed on said wafer for connecting the output of one of said chips to at least one input of another chip of the wafer;
said network including at least one power supply lead and power pad for supplying power to said integrated circuit chips; and
said network including a plurality of reticulate logic lines and pad lines, each of said pad lines being connected to a logic input or output point of one of said chips and having a single coupling to one of said logic lines at a position on said wafer, the intercoupling of said logic lines defining the intercoupling connection of chips of the said network, the network further including at least one additional test lead from a terminal of the network to a grounding point on said wafer where contact can be made to ground and adapted to permit resistance testing of the desired intercoupling connection of chips of the said network to which the test lead is connected to determine if the network itself is operational by measurement of the inherent resistance of the line defined as running from said grounding point through said terminal and to one of the input or output points of one of said chips.

4,479,089

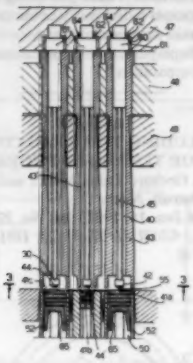
PROCESS AND APPARATUS TO CHECK THE PRESENCE AND/OR EFFICIENCY OF MICROCOMPONENTS DURING THE ASSEMBLING THEREOF ON PRINTED CIRCUIT BOARDS

Beniamino Ferri, Monza, and Giovanni Caimi, Saronno, both of Italy, assignors to Ferco S.r.l., Misinto, Italy

Filed Nov. 5, 1981, Ser. No. 318,365
Claims priority, application Italy, Nov. 10, 1980, 25854 A/80
Int. Cl.³ G01R 19/00; H05K 13/04
U.S. Cl. 324—158 F 9 Claims

1. A process to check the presence and/or efficiency of microcomponents to be assembled on printed circuit boards

comprising the steps of: gripping the microcomponent with a gripping apparatus, initially arranging the gripping apparatus in an open position at the top opening of each of a plurality of microcomponent magazines, wherein as soon as the gripping



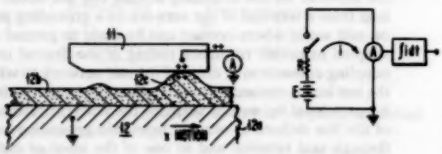
means has gripped the microcomponent, sensing the presence of said microcomponent by a sensing device in said apparatus and, if present, performing an electrical measurement of said microcomponent by a measurement device in said gripping apparatus.

4,479,090

CIRCUITRY FOR MEASURING MAGNETIC HEAD FLYING CHARACTERISTICS

Norman K. Frater; Stanley S. Hoo, both of San Jose, and William H. McConnell, Los Altos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,404
Int. Cl.³ G01N 27/60
U.S. Cl. 324—454 **5 Claims**



1. A method of monitoring characteristics of a magnetic recording head flying in an air bearing relationship relative to a rotating magnetic recording disk,

said magnetic recording disk comprising a dispersion of magnetic particles and load-bearing particles in a binder system, at least some of said load-bearing particles extending above said disk surface,

the material of the face of said magnetic head adjacent said disk surface being different in the triboelectric series from said load-bearing particles and said disk surface, comprising the step of

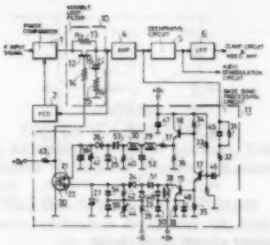
detecting the triboelectric charge generated by intermittent contact between said head and said disk surface to provide an indication of the frequency of said contacts.

4,479,091

PHASE LOCKED LOOP FM DEMODULATOR WITH VARIABLE BANDWIDTH LOOP FILTER

Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 326,946
Claims priority, application Japan, Dec. 3, 1980, 55-169472
Int. Cl.³ H03D 3/00; H03L 7/08
U.S. Cl. 329—122 **4 Claims**



1. An FM demodulation circuit which demodulates an FM signal by the use of a PLL, comprising:

a phase comparator for receiving the signal to be demodulated,

a variable loop filter having a variable band width and connected to receive the output of said phase comparator,

means including a voltage-controlled oscillator receiving the signal from said variable loop filter for producing a control signal for said phase comparator,

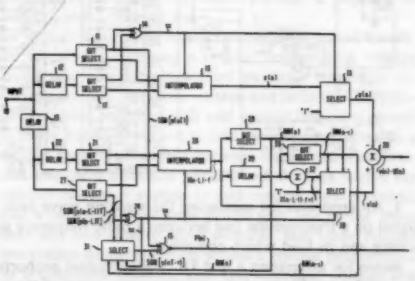
means including a base band processing circuit for detecting a signal component and a noise component having a frequency higher than a maximum modulation frequency of said signal from said variable loop filter and providing an output signal for controlling the loop band width of said variable loop filter in correspondence with the magnitudes of said signal component and said noise component.

4,479,092

DIGITAL FREQUENCY-SHIFT KEYED DEMODULATOR

David D. Falconer, Nepean, Canada, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,462
Int. Cl.³ H03D 3/18
U.S. Cl. 329—145 **6 Claims**



1. An autocorrelation frequency-shift keyed (FSK) demodulator for demodulating a received digital FSK signal by sampling the received signal at periodic sampling points to generate a sampled signal including

means for delaying the sampled signal to generate a delayed sample signal,

means for generating a product signal representing the product of the sampled signal and the delayed sampled signal,

means for integrating the product signal to generate an integrated signal, and

means for comparing the integrated signal to predetermined threshold values to obtain a demodulated FSK signal, said demodulator being characterized by,

means for generating a representation of a first interval since a zero crossing of the received signal to a subsequent sampling point of the received signal,

means for generating a representation of a second interval since a zero crossing of the delayed sampled signal to said subsequent sampling point,

means for generating a representation of the polarity of said product at said subsequent sampling point, and

means supplied with said first interval representation, said second interval representation and said polarity representation for generating a representation of an integration area increment for the period between said periodic sampling points which is terminated by said subsequent sampling point, said integration area increment representing said integrated signal.

4,479,093

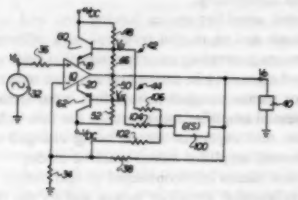
AMPLIFIER HAVING HIGH COMMON MODE REJECTION

Sven Mattisson, Bjarred, Sweden, assignor to Inventab Audio Kb, Lund, Sweden

Filed Dec. 3, 1981, Ser. No. 327,075

Int. Cl.³ H03F 3/45

U.S. Cl. 330—258 **2 Claims**



1. Apparatus comprising:

amplifier means responsive to an input signal provided on an input terminal for providing an output signal corresponding to an amplified said input signal on an output terminal, and having first and second power input terminals, said amplifier means comprising a differential amplifier having inverting and noninverting inputs, means for connecting said noninverting input to said input terminal, and feedback means comprising a feed back impedance connected between said output terminal and said inverting input and an input impedance connected between said inverting input and a fixed potential, whereby said amplifier means has a very high input impedance and a gain determined by the ratio of said feedback and input impedances;

power supply means having first and second power output terminals across which a power supply voltage is provided;

first voltage divider means including first and second impedance means connected in series between said amplifier output and said first power output terminal of said power supply means,

second voltage divider means including third and fourth impedance means connected in series between said amplifier output and said second power output terminal of said power supply means; and

means for applying the signal at the junction of said first and second impedance means to said first power input terminal of said amplifier and the signal at the junction of said third and fourth impedance means to said second power input terminal of said amplifier;

wherein said first, second, third, and fourth impedance means have values selected so that the signals appearing at said first and second power input terminals each includes a component corresponding to said input signal; and

further comprising means for eliminating a component from the output of said differential amplifier and means for adding a signal porportional to the component thus eliminated to the signals appearing at the junction of said first and second impedance means, and the junction of said third and fourth impedance means.

4,479,094

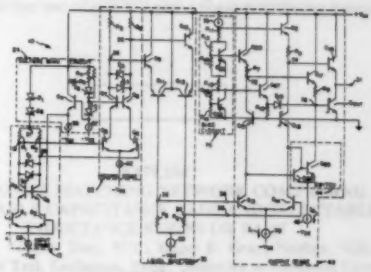
DIFFERENTIAL AMPLIFIER

David J. Harris, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed May 26, 1982, Ser. No. 382,278

Int. Cl.³ H03F 3/45

U.S. Cl. 330—261 **14 Claims**



8. In combination:

(a) a differential amplifier comprising:

(i) a first pair of transistors having connected emitter electrodes;

(ii) a current source coupled to the emitter electrodes of the first pair of transistors;

(iii) a second pair of transistors having connected base electrodes and having emitter electrodes coupled to collector electrodes of the first pair of transistors;

(iv) a pair of resistors coupled between a voltage source and the collector electrodes of the second pair of transistors;

(v) a pair of diodes coupled in opposite polarity between the collector electrodes of the second pair of transistors;

(b) a bias circuit connected between the voltage source and the base electrodes of the second pair of transistors for preventing saturation of the second pair of transistors.

4,479,095

INTEGRATED CIRCUIT AMPLIFIER FOR LOW INPUT VOLTAGES

Hartmut Seiler, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,350

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128028

Int. Cl.³ H03F 3/45

U.S. Cl. 330—261 **9 Claims**

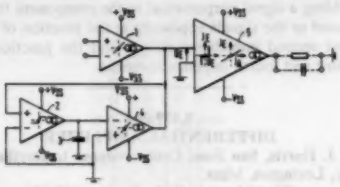
1. Integraged-circuit amplifier for amplifying signal voltages in the lowest voltage range of amplifiable signals, and including a signal amplifier (1) connected as a differential amplifier, and also comprising:

a switching amplifier (2) having its input connected to the output of said signal amplifier (1);

a third amplifier (4) having its output connected to the output of said signal amplifier (1) and its input connected to the output of said switching amplifier (2), and

a capacitor (3) connected between the output of said switching amplifier and a ground connection, whereby said

switching amplifier (2), capacitor (3) and third amplifier (4) cooperate to regulate out an offset voltage that would



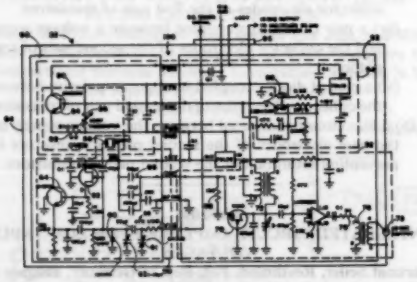
otherwise impair the amplification of small signal voltages by said signal amplifier (1).

4,479,096

VOLTAGE VARIABLE CRYSTAL CONTROLLED OSCILLATOR

William R. Fowks, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 20, 1981, Ser. No. 285,199
Int. Cl.³ H03B 5/36; H03L 1/04, 7/26
U.S. Cl. 331—3 **16 Claims**



1. An improved crystal oscillator of the type having an amplifier and a feedback circuit, at least one element of the feedback circuit being a piezo-electric crystal of material and geometry suitable for presenting an equivalent reactive impedance for causing oscillations at a selected frequency in the amplifier, the improvement comprising:

a connection from a first terminal of said crystal, through a suitable capacitor to an amplifier input and the oscillator output being derived from a second terminal of said crystal through a suitable coupling network, whereby said crystal acts as a low pass filter in said oscillator output to suppress harmonics of said selected frequency

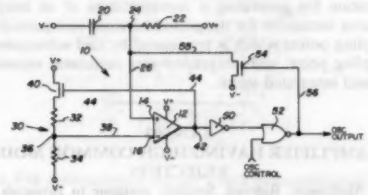
and frequency standard means for receiving a signal from said oscillator output for comparing said signal to a reference signal to generate an error signal to be applied to control the frequency of said oscillator.

4,479,097

LOW VOLTAGE, LOW POWER RC OSCILLATOR CIRCUIT

David N. Larson, Carrollton; Jeffrey Ireland, Farmers Branch, and Michael B. Terry, Carrollton, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/01724, § 371 Date Dec. 24, 1980, § 102(e) Date Dec. 24, 1980, PCT Pub. No. WO82/02298, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 24, 1980, Ser. No. 270,528
Int. Cl.³ H03K 4/50
U.S. Cl. 331—111 **5 Claims**



1. An oscillator circuit having first and second voltage supply sources comprising:

differential amplifier means having first and second input terminals and an output terminal, said differential amplifier means generating an output signal at said output terminal and operating in active and inactive modes;

capacitor means coupled to said first input terminal of said differential amplifier means and to the first voltage supply source, said capacitor means being charged during said differential amplifier means inactive mode;

first switch means interconnected to said output terminal of said differential amplifier means and to the first voltage supply source;

first and second resistor means, said first resistor means being connected between said first switch means and said second input terminal of said differential amplifer means, said second resistor means being connected between said second input terminal of said differential amplifier means and the second voltage supply source, such that said first and second resistor means generate a reference voltage for application to said second input terminal of said differential amplifier means during a portion of said differential amplifier means inactive mode;

delay means connected to said output terminal of said differential amplifier means for delaying said output signal;

second switch means coupled to said delay means and to said capacitor means for discharging said capacitor means to thereby cause said differential amplifier means to operate in said inactive mode, said discharge means activated by said output signal generated by said differential amplifier means during said differential amplifier means active mode;

said first switch means activated by said output signal generated by said differential amplifier means during said differential amplifier means inactive mode for controlling generation of said reference voltage, such that said reference voltage is generated after said capacitor means has completely discharged;

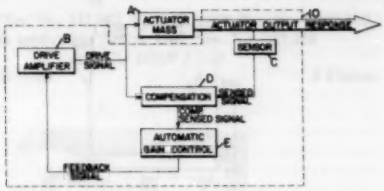
said delay means comprising inverter means coupled to said output terminal of said differential amplifier means, and NOR logic means having one terminal thereof coupled to said inverter means and a second input thereof coupled to a control signal.

4,479,098

CIRCUIT FOR TRACKING AND MAINTAINING DRIVE OF ACTUATOR/MASS AT RESONANCE

William S. Watson, Eau Claire, Wis., assignor to Watson Industries, Inc., Eau Claire, Wis.

Filed Jul. 6, 1981, Ser. No. 280,500
Int. Cl.[3] H03B 5/30; H03L 7/00
U.S. Cl. 331—154 18 Claims



16. An actuator/mass drive circuit for continuously driving an actuator/mass having dynamically changing resonance, at its resonant frequency so as to maintain a constant amplitude signal therefrom, comprising:

(a) a drive circuit responsive to a feedback signal for producing a drive signal to drive said actuator/mass at its natural resonance, wherein said driven actuator/mass produces an oscillatory actuator output signal including parameters related to both drive signal and the resonance of said actuator/mass;

(b) feedback circuit means connected to receive said actuator output signal and being responsive thereto for producing said feedback signal, said feedback circuit means including compensation circuit means for removing from said actuator output signal those said parameters related to said drive signal thereby leaving only those parameters relating to the resonance of said actuator/mass; wherein said feedback signal has phase parameters suitable for maintaining stable drive of said actuator/mass at its natural resonance, and amplitude parameters suitable for maintaining the amplitude of said actuator output signal at a constant predetermined level over a broad range of dynamically changing natural resonant frequencies; wherein said feedback circuit means does not include or depend on any oscillator sources other than said oscillatory actuation output signal to produce said feedback signal; and

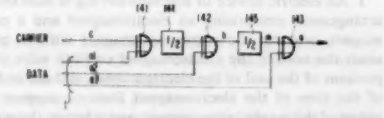
(c) means operatively connecting said feedback circuit means with said drive circuit for applying said feedback signal to said drive circuit, whereby a closed-loop self-generating drive circuit is established.

4,479,099

MULTIPLE PHASE MODULATOR FOR N SETS OF DIGITAL DATA

Masaaki Atobe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,656
Claims priority, application Japan, May 7, 1981, 56-67647
Int. Cl.[3] H03K 7/06; H04L 27/20
U.S. Cl. 332—10 7 Claims



1. A 2^N-phase phase modulator (where N is a positive integer) for providing a 2^N-phase phase modulated signal by phase-modulating a carrier wave with N sets of digital data, comprising:

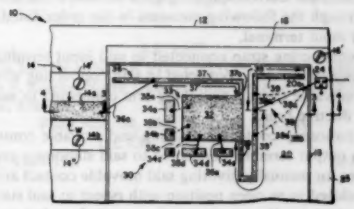
N 2-phase phase modulating means including a first 2-phase phase modulating means and N-1 subsequent 2-phase phase modulating means, each of said 2-phase phase modulating means having first and second input terminals and providing a phase-modulated output, each of said first input terminals being supplied with a respective one of said N sets of digital data, said second input terminal of said first 2-phase phase modulating means being supplied with said carrier wave; and (N-1) ½ frequency-dividing means each receiving and frequency-dividing by one half an output from a respective one of (N-1) of said 2phase phase modulating means, including said first 2-phase phase modulating means but excluding a last one of said (N-1) subsequent 2-phase phase modulating means, and for providing a frequency-divided phase-modulated signal to the second input terminal of a respective one of said subsequent 2-phase phase modulating means, whereby said 2^N-phase phase modulated signal is provided at the output of said last one of said N 2-phase phase modulating means.

4,479,100

IMPEDANCE MATCHING NETWORK COMPRISING SELECTABLE CAPACITANCE PADS AND SELECTABLE INDUCTANCE STRIPS OR PADS

Sanjay B. Moghe, Troy, N.Y.; Roger E. Gray, Nashua, N.H., and Wei Tsai, Lexington, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 27, 1982, Ser. No. 382,733
Int. Cl.[3] H03H 7/38; H01F 5/00; H01G 5/01; H01P 1/00
U.S. Cl. 333—33 6 Claims



4. A microwave frequency circuit having capacitive and inductive reactive components electrically coupled together comprising:

a dielectric substrate having a conductive layer disposed on a first surface thereof;

a plurality of conductive pads disposed on portions of the opposite surface of the substrate and disposed adjacent each other, such plurality of conductive pads, dielectric substrate and conductive layer providing a corresponding like plurality of capacitors, each having a predetermined capacitance;

first means, electrically interconnecting a selected one or ones of such conductive pads for providing at least one capacitive reactive component with a selected capacitance with remaining unselected ones being electrically isolated from each other;

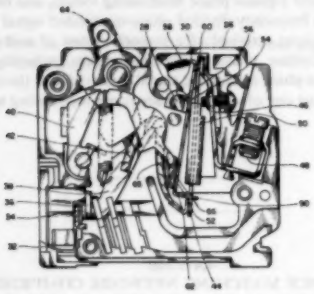
a conductor having a pair of end portions disposed on second portions of such opposite surface of the substrate; and

a wire having a first end electrically interconnected at a point on the conductor disposed between the end portions of such conductor and a second end disposed at the second one of the terminals of the conductor.

4,479,101
CIRCUIT BREAKER WITH SELF-ADJUSTING ARMATURE

Stanley S. Checinski, Glendale Heights, Ill., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Jul. 2, 1982, Ser. No. 394,574
Int. Cl.³ H01H 73/48
U.S. Cl. 335—37 3 Claims



2. An electrical circuit breaker, comprising:

a housing made from electrically insulated material including a pivot guide post;

an electrical current-carrying path in which current flows through the following elements in the order listed:

an input terminal,

a conducting strap connected to said input terminal,

a bimetallic strip connected to said conducting strap,

a movable contact switching arm connected to said conductive braid,

a stationary contact contacting said movable contact,

an output terminal connected to said stationary contact;

means for manually pivoting said movable contact arm from a closed to an open position with rspect to said stationary contact to disrupt electrical current flow between said movable contact arm and said stationary contact;

a magnetic yoke having a first end and partially surrounding said bimetallic strip;

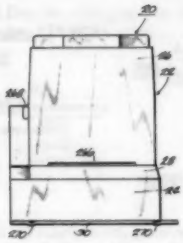
a magnetic armature in movable juxtaposition with said yoke, said armature having a first end having at least one curved arm portion to partially surround said guide post, said first end further including a spring-biasing means for automatically adjusting and maintaining a first end of said armature in contact with the first end of said yoke and a second end of said armature biased away from said yoke and said bimetallic strip, said second end of said armature being provided with a latch holder, said second end of said armature being pivotably attracted toward said yoke when current through said bimetallic strip exceeds a predetermined amount; and

a latch means for electrically disconnecting said movable contact from said stationary contact, said latch means having one end in engagement with said latch holder when said spring-biasing means maintains said second end away from said yoke, said latch means being disengaged from said holder to electrically disconnect said movable contact from said stationary contact when said second end is attracted toward said yoke.

4,479,102
MACHINE TOOL RELAY STRUCTURE

Kenneth J. Marien, Wauwatosa, and Winfred R. Lemke, Mequon, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Aug. 25, 1982, Ser. No. 411,387
Int. Cl.³ H01H 50/04
U.S. Cl. 335—132 10 Claims



1. An electromagnetic switch comprising:

a base assembly including a base part, a stationary magnet pole piece and a magnet coil with the pole piece and the magnet coil positioned by the base part,

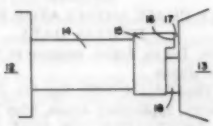
an upper housing assembly including: an upper housing part, a movable armature assembly positioned and guided for movemeat in the upper housing part and a plurality of compression springs with each of said springs having an end positioned on the armature assembly,

and a middle housing part positioned between the base part and the upper housing part said middle housing part having a first side attached to the upper housing part through a releasable connection and providing seats for the springs and maintaining the springs and the armature assembly within the upper housing part when the base part and the middle housing part are separated.

4,479,103
POLARIZED ELECTROMAGNETIC DEVICE

J. Milton Bailey, Knoxville; Igor Alexeff, Oak Ridge, both of Tenn., and Werner H. Kreidl, Vaduz, Liechtenstein, assignors to Motor Magnetics, New York, N.Y.

Filed Apr. 4, 1980, Ser. No. 137,229
Claims priority, application Austria, Apr. 5, 1979, 2551/79
Int. Cl.³ H01F 7/00
U.S. Cl. 335—229 7 Claims



1. An electric device or machine having at least one magnet arrangement comprising an electromagnet and a permanent magnet, wherein the permanent magnet with its pole faces abuts the core of the electromagnet on both sides of the end portions of the coil of the electromagnet, and the end portions of the core of the electromagnet form or support the pole pieces of the magnet arrangement, and wherein the poles of the permanent magnet are adjacent the like poles of the electromagnet to provide additive flux at a pair of pole ends of said core when the electromagnet is fully energized, characterized in that the core structure is so dimensioned that the maximum value of the energizing current of the electromagnet is sufficient but not greater than necessary for reaching the first

practical saturation value of flux density in said pole ends of the core in the absence of said permanent magnet.

4,479,104

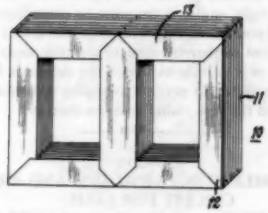
TRANSFORMER CORE HAVING CHARGE DISSIPATION FACILITY

Robert H. Ettinger, Schenectady, N.Y., and Walter J. Pasko, Lee, Mass., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 131,652, Mar. 19, 1980, Pat. No. 4,327,349. This application Jan. 6, 1982, Ser. No. 337,234

Int. Cl.³ H01F *27/24*

U.S. Cl. 336—219 **5 Claims**



1. A transformer core comprising: at least two legs;

upper and lower yokes joining said legs in a closed magnetic circuit, said legs and yokes each including a plurality of steel laminations arranged in a stack, electrically insulated from each other, and having a passageway therethrough;

an electrical ground lead connected with at least one of said core laminations;

semiconductor material disposed within said passageway and cooperating with said ground lead and said laminations to provide a current leakage path to ground for excessive electrical charges created on said core laminations as a result of a transformer impulse voltage condition.

4,479,105

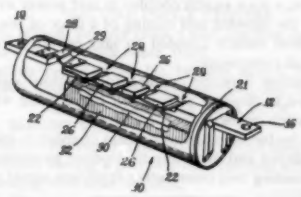
PYROTECHNIC CURRENT INTERRUPTER

Alexander J. Banes, Palos Park, Ill., assignor to G & W Electric Company, Blue Island, Ill.

Filed Mar. 8, 1983, Ser. No. 473,236

Int. Cl.³ H01H *85/00, 37/76*

U.S. Cl. 337—4 **8 Claims**



1. Apparatus for automatically interrupting current in an electrical circuit before the first current peak after an excess current condition develops comprising:

conductor means in said circuit;

pyrotechnic charge means associated with said conductor means for segmenting said conductor means at a plurality of locations when said charge means is ignited; and

current sensing means comprising a fuse link connected in series with said conductor to provide a rapid temperature rise in response to said overload condition so as to ignite said charge means.

4,479,106

ROTARY ELECTRIC COMPONENT

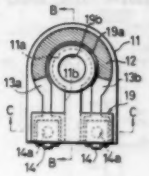
Yutaka Shimizu; Junichi Imura, and Shoichi Henmi, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,600

Claims priority, application Japan, Feb. 12, 1982, 57-19129[U]; Feb. 12, 1982, 57-19130[U]

Int. Cl.³ H01C *10/30*

U.S. Cl. 338—160 **5 Claims**



1. A rotary electric component comprising:

(a) an insulating substrate having a hole adapted to receive a rotary shaft, and a slot communicating with said hole;

(b) a resistor mounted on said insulating substrate concentrically with said hole;

(c) a pair of electrodes mounted on said insulating substrate and connected to said resistor at respective ends thereof, said electrodes being positioned on respective sides of said slot and prevented by the latter from shortcircuiting therebetween;

(d) a pair of terminals mounted on said insulating substrate and connected to said electrodes, respectively;

(e) a shaft rotatably mounted in said hole and having a movable contact held in sliding contact with said resistor; and

(f) a body of synthetic resin filling portions of said slot.

4,479,107

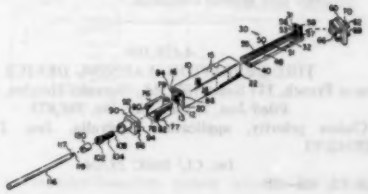
PRECISION LINEAR POTENTIOMETER SENSOR

William F. Bleeke, North Webster, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Nov. 24, 1982, Ser. No. 444,181

Int. Cl.³ H01C *10/38*

U.S. Cl. 338—176 **10 Claims**



1. A potentiometer comprising a flexible inert substrate having an accurately configured series of electrical elements thereon and which are isolated one from the other by said substrate, said elements having been effected by laser sculpting to produce an accurately defined resistance path and collector path, conductive material disposed on the isolated elements to provide electrical connections with respective termination means, a housing having longitudinally formed slot means disposed on opposite interior walls of said housing and receiving the curled edges of said substrate which has a width greater than the interior width of said housing, said housing providing a flat interior base which the substrate engages, and combina-

tion slider-and-contactor means movable longitudinally within said housing and with the contactor means engaging the resistor and collector paths to transduce the change in the longitudinal position of said slider to a voltage output.

4,479,108

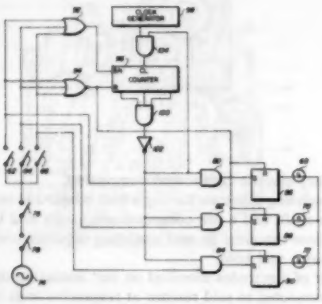
SYNCHRONIZATION INDICATOR FOR AT LEAST TWO CARBURETORS

David Bookbinder, 448 E. Annette, Phoenix, Ariz. 85022

Filed Apr. 28, 1982, Ser. No. 372,736

Int. Cl.³ G01M *15/00*; B60Q *9/00*

U.S. Cl. 340—52 R **9 Claims**



1. An apparatus for indicating when each of a plurality of carburetors are synchronized with each other, each of said carburetors being equipped with a throttle valve which is opened to terminate its associated carburetor's idle mode of operation and initiate its high speed mode of operation, each of said throttle valves being coupled to a throttle valve control mechanism which is responsive to an accelerator control for opening and closing each of said throttle valves, said apparatus comprising:

a plurality of switch means each one mounted proximate one of said plurality of carburetors and responsive to movement of said control mechanism, each of said switch means assuming a first condition when said throttle valve is in its idle position and assuming a second condition when said throttle valve opens beyond its idle position; and

circuit means coupled to each of said switch means for giving a visual indication when each of said switch means assumes said second condition.

4,479,109

TIRE DEFLATION WARNING DEVICE

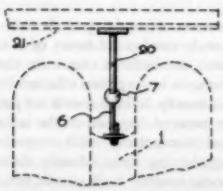
Ernest French, 117 Somerville Rd., Hornsby Heights, Australia

Filed Jun. 7, 1982, Ser. No. 385,873

Claims priority, application Australia, Jun. 17, 1981, PE9343/81

Int. Cl.³ B60C *23/04*

U.S. Cl. 340—58 **2 Claims**



1. A tire deflation warning device comprising, in combination, a spring-loaded plunger arrangement and a co-operating trip arm; said spring-loaded plunger arrangement being attachable to the underside of the periphery of a spacer ring of a dual wheel assembly and said co-operating trip arm being pivotally attachable to the outer side of the periphery of the said spacer ring; said spring-loaded plunger arrangement including a flexible conduit for communication with the valve of a tire of said dual wheel assembly or of an inner tube thereof; the plunger of said arrangement, when in its extended position due to said tire or tube being inflated to optimum pressure, being adapted to engage, through a slot in said spacer ring's periphery, a co-acting element of said trip arm to maintain it substantially parallel to the spacer ring's periphery but, when in its retracted position due to deflation of said tire or tube, disengages from said element to thereby permit said trip arm to swing through substantially a right angle, in response to centrifugal force, to assume a radial position in which its outer end is able to contact a contact element to thereby actuate a visible and/or audible signal in a cab of a vehicle to which the device is fitted, stop means being provided to prevent swinging movement of said trip arm beyond the said radial position thereof.

4,479,110

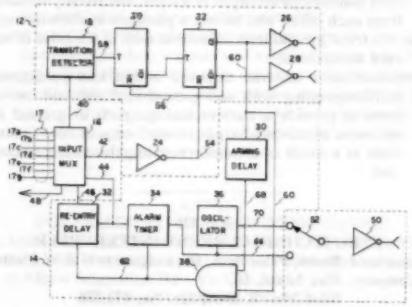
AUTOMOBILE BURGLAR ALARM AND ARMING CIRCUIT FOR SAME

Teno P. Cipri, 658 Borregas Ave., Sunnyvale, Calif. 94086

Filed Jan. 18, 1982, Ser. No. 340,263

Int. Cl.³ B60R *25/00*

U.S. Cl. 340—63 **9 Claims**



1. A vehicle burglar alarm arming circuit for a burglar alarm installed within a vehicle having a negative ground D.C. power source, a door switch coupled to said power source and actuated by the opening and closing of a door of the vehicle, and an ignition switch coupled to said power source, said arming circuit comprising:

(a) a transition detector coupled to said door switch and operative to develop a transition signal pulse when said door switch opens or closes; and

(b) divide-by-two and latching means coupled to said transition detector and operative to produce an arming signal after counting two consecutive transition signal pulses.

4,479,111

PHOTO-OPTICAL SWITCH APPARATUS

Craig C. Madsen, Indian Harbour Beach; Daniel B. Stewart, Middleburg, and James Andree, Orange Park, all of Fla., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 9, 1982, Ser. No. 347,244

Int. Cl.³ G06F *3/02*; H01H *3/12*, *13/00*, *13/14*

U.S. Cl. 340—365 P **9 Claims**

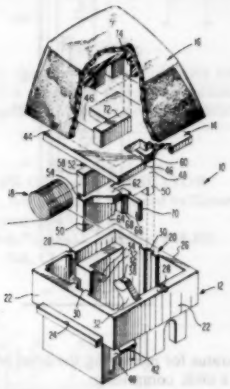
1. Photo-optical switch apparatus comprising,

a mounting structure providing a housing for photo-optical light generating and detecting means disposed in spaced

relation such that light can pass from a light generator to a light detector in the unblocked condition of said apparatus,

light blocking means slideably movable relative to said mounting structure and including means slideably carried thereon for biasing said light blocking means into a light unblocking position relative to said light generating and detecting means,

means on said mounting structure in the path of movement of said light blocking means engageable with said biasing means when said light blocking means has moved to the light blocking position for generating positive tactile feedback or feel indicative of the position of said light blocking



means relative to said light generating means and said detecting means,

means integral with said light blocking means for guiding and locking said light blocking means within said support structure effective to prevent accidental dislodgement thereof while permitting vertical slideable movement of said light blocking means relative to said support structure and said light generating and detecting means, and

demountable means providing a finger engaging member operably interconnected with said light blocking means so that physical moveme.st or pressure against said finger engaging means will cause said light blocking means to move into a light blocking position.

4,479,112

SECURE INPUT SYSTEM

Steven B. Hirsch, Beverly Hills, Calif., assignor to Secure Keyboards Limited, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 146,404, May 5, 1980, Pat. No. 4,333,090. This application May 19, 1982, Ser. No. 379,755

Int. Cl.³ G06F *3/02*; E05B *45/06*

U.S. Cl. 340—365 VL **10 Claims**

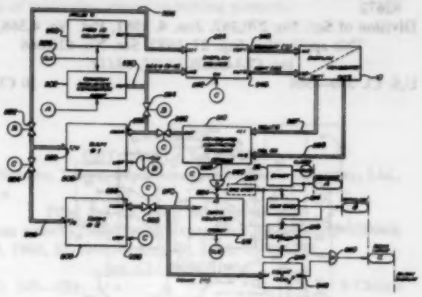
1. A secure keyboard input system comprising:

a deyboard having a plurality of individual keys and corresponding character displays;

means for generating apparently random pairings between the individual keys and individual characters included in a set of characters, and means for displaying the individual characters in correspondence with the respective paired keys;

means for translating the actuation of particular keyboard keys into signals representing the corresponding characters paired to said keys;

means for restricting the view of the character displays from other than the individual operating the keyboard, said view restricting means including optical grid means including a plurality of closely spaced transparent plates having non-transparent means between said plates, overlying said displaying means, for restricting the angle of view to less than ten degrees from perpendicularity to the keyboard; and



means for selectively initiating a new set of apparently random pairings between said keys and said characters.

4,479,113

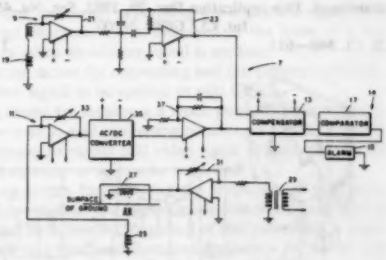
COMPENSATED INTRUDER-DETECTION SYSTEMS

David R. McNeilly, Maryville, and William R. Miller, Andersonville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 20, 1982, Ser. No. 340,907

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—501 **10 Claims**



1. In an intruder-detection system wherein an intruder-induced signal is transmitted through a medium whose signal-conductance changes with variations in a climatic condition to which said medium is exposed, the improvement comprising:

first means coupled to said medium for converting signals transmitted therethrough to a first electrical signal,

second means for continuously generating an electrical reference signal proportional to the signal-conductance of said medium,

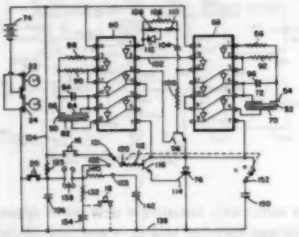
third means for receiving the first electrical signal and said reference signal and generating therefrom an electrical output signal unaffected by said signal-conductance changes, and

fourth means for giving warning when said output signal exceeds a selected value.

4,479,114
OMNIDIRECTIONAL ACCELERATION ALARM AND SWITCH THEREFOR

Yujiro Yamamoto, 1201 Via La Jolla, San Clemente, Calif. 92672

Division of Ser. No. 270,262, Jun. 4, 1981, Pat. No. 4,386,341. This application Sep. 27, 1982, Ser. No. 423,666
Int. Cl.³ G08B 13/02, 13/14
U.S. Cl. 340—566 10 Claims

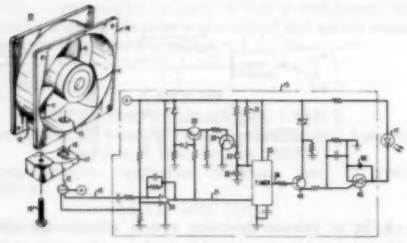


1. In a security system:
sound generating means for generating two audible tones and interrupting means for interrupting one of said tones at a sub-audible rate; and
acceleration detection means for initiating operation of said sound generating means comprising a switch having one of its contacts mounted for movement in response to movement of a spring and weight combination capable of omnidirectional movement relative to the other contact of said switch.

4,479,115
FAN SPEED AND/OR FAN FAILURE DETECTOR

Norman H. Holzhauer, Aberdeen, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 406,089, Aug. 6, 1982, abandoned. This application Dec. 20, 1982, Ser. No. 451,549
Int. Cl.³ G08B 21/00
U.S. Cl. 340—611 7 Claims

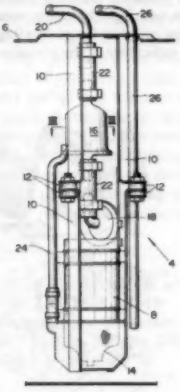


1. Apparatus for use in conjunction with a fan, said apparatus comprising,
transducer means for generating a stream of pulses in response to pressure waves impinging thereon,
means adapted for mounting said transducer means in such proximity to said fan that the pressure waves generated by said fan when it is operating impinge on said transducer means, and
means for generating a signal indicative of the time interval between successive pairs of said pulses and for providing an indication when said signal reaches a predetermined threshold.

4,479,116
CAPACITIVE TYPE FUEL LEVEL AND IMPURITY INDICATOR

Hiroshi Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Aug. 16, 1982, Ser. No. 408,704
Claims priority, application Japan, Aug. 27, 1981, 56-133340
Int. Cl.³ G08B 21/00; G01F 23/26
U.S. Cl. 340—620 11 Claims



1. An apparatus for measuring the level of a liquid medium contained in a tank, comprising:
a set of measuring electrodes immersed in said liquid medium for developing a capacitance which varies with the amount of liquid medium in said tank;
a pump disposed within said tank;
means defining a chamber into which said pump discharges said liquid medium, said chamber being adapted to be totally filled by the discharge of said pump;
a plurality of parallel reference electrodes which are disposed in said chamber and arranged parallel to the direction that the liquid medium flows through said chamber and so that said liquid medium flows between said electrodes, said electrodes being arranged so that alternating electrodes are electrically connected for developing a capacitance which varies with the dielectric constant of said liquid medium flowing through said chamber; and
circuit means associated with said measuring electrodes and said reference electrodes for producing a signal indicative of the amount of liquid medium in said tank.

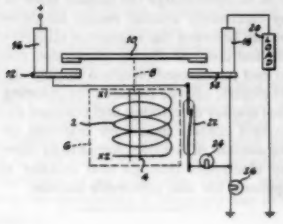
4,479,117
ADD-ON STATE INDICATOR FOR AN ENCLOSED D.C. POWER RELAY

Walter L. Marquardt, Menomonee Falls, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 24, 1982, Ser. No. 423,396
Int. Cl.³ G08B 21/00
U.S. Cl. 340—644 7 Claims

1. An operating condition indicating enclosed relay having an electromagnet including a coil for operating contacts and a housing enclosing said electromagnet and its coil and said contacts and external terminals for connecting said relay in an electric power supply circuit comprising in combination therewith of:
an electrically energizable indicator;
means connecting said indicator acoss said contacts so as to be shunted and deenergized when said contacts close;
a magnetic field operated circuit closing means;
means mounting said circuit closing means to said coil housing; and

means connecting said circuit closing means in circuit with said indicator so as to be closed by the magnetic field of said electromagnet when said coil is energized to energize



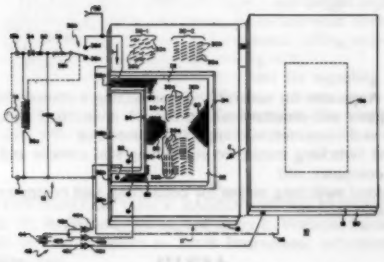
said indicator in the event said contacts do not close although said coil is energized thereby to indicate said coil energization together with failure of said contacts to close.

4,479,118

POWER OUTAGE INDICATOR

Herbert S. Cole, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 11, 1982, Ser. No. 348,101
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—663 **20 Claims**



1. An indicator for displaying an indication of a power outage of an associated power source, comprising:

a smectic liquid crystal display cell having a layer of smectic liquid crystal material contained between first and second electrodes; at least one of said first and second electrodes having an indicia forming electrode portion having first and second opposed ends; said cell having the liquid crystal material thereof initially aligned in a first optical condition;

first and second terminal means for connection to opposite sides of said source; and

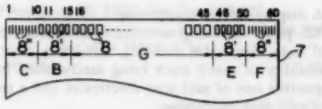
means connected to said terminal means for providing a flow of current through said indicia-forming electrode portion responsive to a power outage of said source to cause that portion of said display cell defined by said indicia-forming electrode portion to change from said first optical condition to another optical condition, with said cell portion remaining in said second condition until said cell is reset; said means comprising: an electrical capacitor, having first and second terminals, for storing electrical charge while said source is operative; a unidirectionally-conducting element coupled between the second terminal means and the first capacitor terminal; a relay having a relay coil connected to said first and second terminal means and across said source, and a relay switching portion having a common terminal and a normally-closed terminal coupled between one end of said indicia-forming electrode portion and said capacitor first terminal, said relay opening the connection between said common and normally-closed terminals when said source is coupled to said terminal means; said electrode portion second end and said capacitor terminal being coupled together to said first terminal means; and a current-limiting resistance connected between said capacitor first terminal and the common terminal of said relay means switching portion.

4,479,119

CRT DISPLAY DEVICE

Yukio Sakano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jul. 15, 1981, Ser. No. 283,640
Claims priority, application Japan, Jul. 16, 1980, 55-100043; Jul. 29, 1980, 55-104014; Aug. 20, 1980, 55-114275
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—731 **9 Claims**



1. A CRT display device for displaying characters in a standard display mode or at least one compressed display mode selectively by means of the raster type scanning along a predetermined number of character rows extending from one end to the other in the display area defined on the screen of a CRT, wherein the characters in said rows are displayed all in the same size when said standard display mode is selected, and wherein the characters in at least one of a plurality of columnar regions are displayed as compressed while displaying characters uncompressed in the other of said columnar regions, thereby maintaining legibility of characters in said other columnar regions while increasing the number of characters displayed in a character row when said compressed display mode is selected, comprising:

generating means for generating a dot pattern signal of a desired character to be displayed in the form of a dot matrix when an address signal is applied;

converting means for converting said dot pattern signal into a video signal to be applied to said CRT;

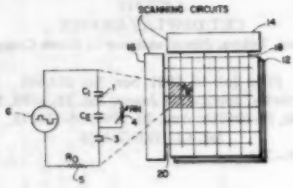
timing means for supplying a clock pulse signal including a pulse train to said converting means causing said converting means to supply said video signal in accordance with the frequency of said pulse train; and

adjusting means for adjusting the frequency of said pulse train in response to a display mode selection signal applied thereto such that the frequency of said pulse train is maintained at a first predetermined frequency for all of said character rows when said display mode selection signal indicates said standard display mode, and the frequency of said pulse train is changed to a second predetermined frequency which is higher that said first predetermined frequency for characters in said at least one columnar region of a character row while maintaining said first predetermined frequency for characters in the other of said columnar regions therby maintaining legibility of characters in said other regions while increasing the number of characters displayed in a character row, whereby the characters in said at least one columnar region are displayed as compressed while other characters in said row are displayed as uncompressed in the other of said regions when said display mode selection signal indicates said at least one compressed display mode.

4,479,120
METHOD AND APPARATUS FOR DRIVING A THIN-FILM EL PANEL

Toshihiro Obba; Masashi Kawaguchi, both of Nara; Hiroshi Kinoshita; Yoshiharu Kanatani, both of Tenri, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 13, 1981, Ser. No. 310,753
Claims priority, application Japan, Oct. 15, 1980, 55-145014
Int. Cl.³ G09G 3/30
U.S. Cl. 340—781 10 Claims

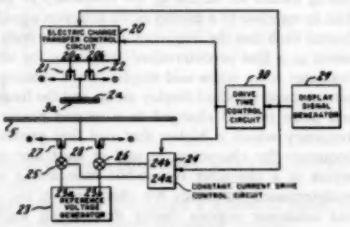


1. A display device comprising:
an EL panel including an array of scan electrodes, an array of data electrodes crossing said scan electrodes and a plurality of pixels each lying sandwiched between a respective one of said scan electrodes and a respective one of said data electrodes;
means for sequentially applying a write voltage pulse to each pixel of said display in a line scanning fashion;
means for applying a refresh voltage pulse of a polarity opposite that of said write voltage pulse to the entire said panel upon completion of each single scan by said means for applying a write voltage pulse; and
means for applying to the said display panel for each application of said refresh voltage pulse, a compensation voltage pulse for compensating for the difference of amplitude of polarized charges due to the difference in phase relationship between said refresh voltage pulse and each write voltage pulse among said pixels.

4,479,121
ELECTROCHROMIC DISPLAY DEVICE HAVING CONSTANT COLOR DENSITY AND DRIVING METHOD THEREFOR

Junichi Tabata, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,160
Claims priority, application Japan, Apr. 25, 1980, 55-55203
Int. Cl.³ G09G 3/34
U.S. Cl. 340—785 15 Claims

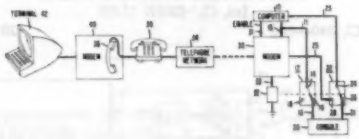


1. In an electrochromic display device having a plurality of display electrodes exhibiting either colored or bleached states depending on the density of electric charge held by the display electrodes, a counter electrode spaced from the display electrodes, an electrolyte in contact with the counter and display electrodes, and means for selectively applying a voltage between preselected colored display electrodes and preselected bleached display electrodes effective to transfer electric charges held in said preselected colored display electrodes through the electrolyte to said preselected bleached display electrodes so as to interchange the display state of said preselected display electrodes: control means for determining the difference amount between the amount of electric charge held in said preselected colored display electrodes which is to be transferred to said preselected bleached display electrodes and the amount of electric charge required for coloring said preselected bleached display electrodes; and constant current means responsive to said control means for injecting or extracting said difference amount of electric charge to or from said preselected display electrodes through said counter electrode to thereby compensate for said difference amount.

4,479,122
REMOTELY CONTROLLED SWITCHED ACCESS TO THE CONSOLE PORT OF AN ELECTRONIC COMPUTER

Brian E. Redman, Hopatcong, and Gordon D. Woods, Denville, both of, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 5, 1982, Ser. No. 355,262
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.06 10 Claims

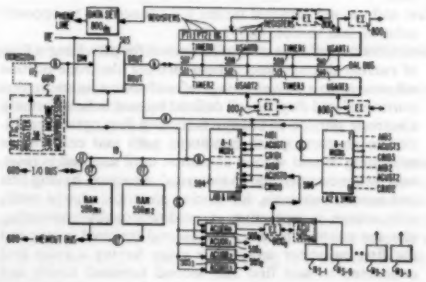


1. Apparatus for reversibly disconnecting a console from a computer and simultaneously therewith connecting a modem with said computer, said apparatus comprising
first switching means for connecting said console and said computer, and
second switching means for connecting said computer and said modem.

4,479,123
AUTOMATIC CALLING UNIT CONTROL SYSTEM

Richard A. Loskorn, Dana Point, and Lyle O. Jevons, Jr., Mission Viejo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1982, Ser. No. 386,409
Int. Cl.³ H04Q 9/00, 3/54
U.S. Cl. 340—825.06 7 Claims



1. In a data communications subsystem for controlling data transfer operations between a host computer and remote data terminals connected by telephone lines through an automatic calling unit and an associated data set, and wherein said subsys-

tem uses a plurality of line adapters controlled by a microprocessor and said line adapters have multiplexor connection means for communicating to an I/O bus of said microprocessor and wherein said microprocessor has first and second output control registers for providing control data and information data to said plurality of line adapters, an automatic calling unit control system for establishing telephone line connections for a selected line adapter comprising:

(a) a plurality of automatic calling unit-output registers, each of which is dedicated to a particular line adapter, said automatic calling unit-output registers being connected to receive dialing digit data from said second output control register of said microprocessor, and providing an output for connection to an automatic calling unit which has capability for connecting a telephone line to a designated line adapter;

(b) means to designate a particular line adapter for transmit/-receive operations or for service operations, said means to designate also providing an enabling signal to a selected one of a plurality of automatic calling unit-output register gating means;

(c) a plurality of said automatic calling unit-output register gating means for enabling a selected one of said automatic calling unit-output registers to provide digit dialing and control signals to said automatic calling unit associated with a designated line adapter, said gating means having input lines from the said designate means and from an address decoder means;

(d) said address decoder means for receiving and decoding address signals from said microprocessor for activating a selected one of said automatic calling unit-output register gating means, said gating means, when activated, enabling the clocking of data from said automatic calling unit-output register to said automatic calling unit;

(e) means in said automatic calling unit for signaling said microprocessor, via said multiplexor means, as to the completion or incompletion of connection of a telephone line usable by the selected line adapter.

4,479,124

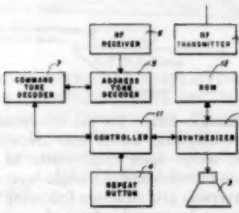
SYNTHESIZED VOICE RADIO PAGING SYSTEM

Arthur M. Rodriguez, Sunrise, and Larry L. Watkins, Sarasota, both of Fla., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 77,216, Sep. 20, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 282,220

Int. Cl.³ H04Q *9/00*; G08B *5/22*

U.S. Cl. 340—825.44 **18 Claims**



1. A synthesized voice pager device comprising:

memory means having a plurality of speech values stored therein as firmware in a form from which synthesized human speech may be derived;

receiver means for receiving coded signals radiated from an external source physically unconnected to said pager device, said radiated coded signals including coded signals representative of a sequence of speech values stored in said memory means;

decoder means operably associated with said receiver means and responsive to at least a portion of the received coded signals for determining whether the received coded signals are intended for the particular pager device;

controller means operably coupled to said decoder means for accessing the sequence of speech values in said memory means corresponding to the received coded signals provided that said decoder means has determined the received coded signals to be intended for the particular pager device;

speech synthesizer means for receiving said accessed sequence of speech values from said memory means and generating analog signals representative of human speech corresponding thereto; and

audio means for converting said analog signals into audible synthesized human speech vocalizing a communicative message to the user of the pager device.

4,479,125

RADIO PAGING RECEIVER CAPABLE OF MUTING BATTERY SAVING FUNCTION

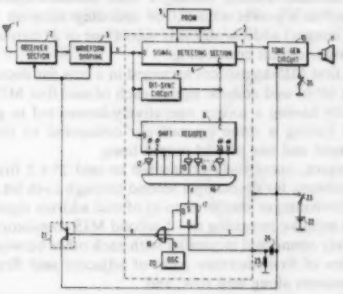
Toshihiro Mori, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1982, Ser. No. 393,925

Claims priority, application Japan, Jul. 14, 1981, 56-109776

Int. Cl.³ H04B *1/16*

U.S. Cl. 340—825.44 **9 Claims**



1. A radio paging receiver comprising:

a receiver section for receiving a preamble signal, a specified signal for test, and a call signal including an address signal;

means for storing in advance an identification number assigned to said radio paging receiver;

means for detecting said preamble signal from the output of said receiver section to provide a preamble detection signal;

signal detecting means for comparing said address signal supplied from said receiver section and an output read out of said storing means and, upon detection of their coincidence, supplying an identity signal;

means for generating an alert signal in response to said identity signal;

battery saving means for, when activated, supplying power from a battery to said receiver section either intermittently in a prescribed cycle so that said receiver section can receive at least said preamble signal or for a prescribed period of time so that said receiver section can receive said address signal in response to said preamble detection signal, said battery saving means when deactivated permitting continuous supply of power to said receiver section;

specified signal detecting means for detecting said specified signal from the output of said receiver section and supplying a signal to suspend battery saving; and

battery saving suspending means for deactivating said battery saving means in response to said signal to suspend

battery saving, thereby placing the receiver in condition for test operation.

4,479,126

MIS DECODER CIRCUIT

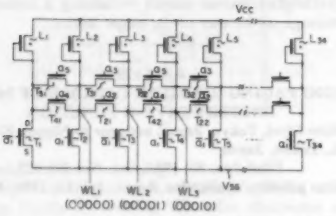
Mitsuo Higuchi, Tokyo, and Hideki Arakawa, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 393,114

Claims priority, application Japan, Jun. 30, 1981, 56-100519

Int. Cl.³ H03K *19/094*; H04Q *9/00*

U.S. Cl. 340—825.86 **8 Claims**



1. A decoder circuit, having a load element operatively connected to a power source, for decoding an n bit (n is a positive integer) address signal to select one of 2^n output lines, said decoder circuit comprising:

2^n+2 first MIS transistors arranged in a row for decoding a first bit of said address signal, each of said first MIS transistors having a source operatively connected to ground and having a drain operatively connected to the load element and one of said output lines;

first means, operatively connected to said 2^n+2 first MIS transistors, for decoding a second through m-th bit (m is a positive integer smaller than n) of said address signal, said first means comprising m−1 second MIS transistors operatively connected in parallel with each other between said drains of first alternate pairs of adjacent said first MIS transistors along said row; and

second means, operatively connected to said 2^n+2 first MIS transistors, for decoding an (m+1)-th through an n-th bit of said address signal, said second means comprising n-m third MIS transistors operatively connected in parallel with each other between said drains of second alternate pairs of adjacent said first MIS transistors along said row and each having a gate, said first and second means arranged alternately along said row.

4,479,127

BI-LOOP ANTENNA SYSTEM

Normand Barbano, Sunnyvale, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 30, 1982, Ser. No. 412,743

Int. Cl.³ H01Q *11/14*

U.S. Cl. 343—742 **4 Claims**

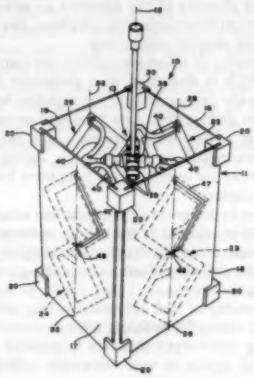
1. An antenna system comprising an array having four antennas disposed in a first pair of parallel planes and in a second pair of parallel planes, respectively, said first and second pairs of planes being perpendicular to each other, the antennas of each pair being equally spaced apart,

each antenna comprising a continuous electrical conductor configured as two open ended substantially square and identical loops connected together at the open ends to constitute two spaced feed points,

said loops of each antenna having colinear diagonals extending parallel to corresponding diagonals of said loops of the other antennas,

means to feed said array of antennas comprising

a power divider having an input port and four output ports, four coaxial cables having equal lengths and respectively connected between said output ports and said antennas, each of said cables having an inner conductor and an outer conductor, the outer conductors of said cables being elec-



trically connected to the loop conductors, respectively, the inner conductor of each of said cables being electrically connected to one of said feed points of the antenna to which the corresponding outer conductor is connected.

4,479,128

POLARIZATION MEANS FOR GENERATING CIRCULARLY POLARIZED ELECTRO-MAGNETIC WAVES

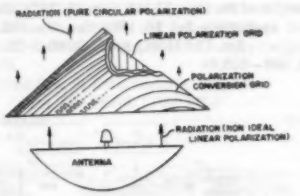
Anton Brunner, Wangen, and Klaus Rieskamp, Soecking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,323

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027094

Int. Cl.³ H01Q *15/24*

U.S. Cl. 343—756 **10 Claims**



1. A re-polarization means for the conversion of linearly polarized electro-magnetic waves into circularly polarized electro-magnetic waves upon employment of a device for linear polarization filtration and of a single-layer or multi-layer polarization conversion grid structure following the device for linear polarization and mounted in front of a radiation aperture and respectively consists of a plurality of conductors extending substantially parallel to each other in the form of straight lines, meander lines, line-rectangle combinations or the like, characterized in that the device for linear polarization filtration is a single-layer or multi-layer designed grid structure (**1**, **2**) which precedes relative to the electro-magnetic waves the polarization conversion grid structure (**3**, **4**, **5**) in the direction toward the radiation aperture so that both grid structures are insulated from one another and are disposed so as to be above one another layer-by-layer in a substantially non-planar manner, and the grid structure layers forming the device for linear polarization filtration consists of straight-line conductors extending

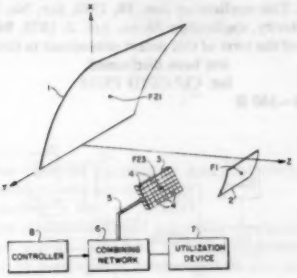
substantially parallel to each other and have a direction relative to the longitudinal direction of the conductors in the polarization conversion grid structure of 45°, and characterized in that, for a curved, non-planar lattice structure, the orientation of said straight lines for accomplishing linear polarization filtration and of said meander lines for accomplishing circularly polarization are shaped so that projection of them on one plane perpendicular to the primary radiation axis results in straight lines.

4,479,129

DIRECTIVE ANTENNA SYSTEM EMPLOYING A PARABOLOIDAL MAIN DISH AND ELLIPSOIDAL SUBDISH

George Skahill, 159 Clay Pitts Rd., Greenlawn, N.Y. 11740

Filed Sep. 10, 1981, Ser. No. 301,056
Int. Cl.³ H01Q *19/19*
U.S. Cl. 343—781 P **3 Claims**



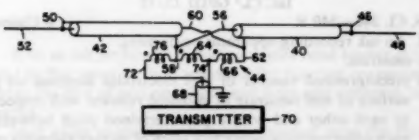
1. A directive antenna system comprising:
(a) a directive feed having an angular field M times that of the system,
(b) an objective element consisting of a concave sheet of reflective material in the form of a section of a paraboloid of revolution, said objective element having a principal focus at a point F1 and an aperture substantially M times that of said directive feed, and
(c) a field element consisting of a concave sheet of reflective material in the form of a section of an ellipsoid of revolution disposed with its center substantially at said point F1 and having two foci, one substantially at the center of the surface of said objective element and the other substantially at the center of said directive feed, said field element having an aperture sufficient to cover the angular field of said directive feed.

4,479,130

BROADBAND ANTENNAE EMPLOYING COAXIAL TRANSMISSION LINE SECTIONS

Richard D. Snyder, 646 Pinehurst Ave., Placentia, Calif. 92670

Continuation-in-part of Ser. No. 270,746, Jun. 5, 1981, abandoned. This application Jun. 1, 1982, Ser. No. 383,627
Int. Cl.³ H01Q *9/16*
U.S. Cl. 343—802 **38 Claims**



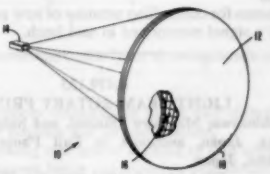
14. An antenna system comprising:
a dipole antenna the electrical length of each of whose legs corresponds to one-quarter of the wave length at a selected frequency; and
a pair of compensation stubs in the form of shorted coaxial transmission lines substantially one-quarter wave length long electrically at said selected frequency, each of said stubs having as its outer conductor a portion of the length of a respectively associated one of the legs of said antenna, and having its center conductor connected to the inner end of the other of the legs of said antenna.

4,479,131

THERMAL PROTECTIVE SHIELD FOR ANTENNA REFLECTORS

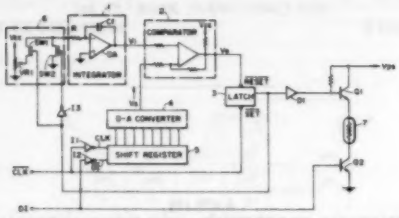
James E. Rogers, Woodland Hills; James S. Warniak; Lowell M. Hobrock, both of Los Angeles; Michael A. Bafico, Lawndale, and Stephen R. Scheele, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 191,050, Sep. 25, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,648
Int. Cl.³ H01Q *1/40*
U.S. Cl. 343—872 **5 Claims**



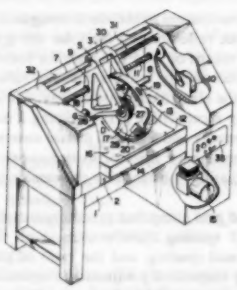
1. A shield for protecting an antenna reflector of electromagnetic energy against thermal distortion from solar energy, comprising:
a substrate transparent to the electromagnetic energy placed between the reflector and the solar energy; and
at least two means on said substrate for substantially rejecting the solar energy while remaining substantially transparent to the electromagnetic energy, a first of said means comprising a capacitive grid rejecting a major portion of the solar energy and a second of said means comprising an optical interference filter of matter capable of absorbing and re-radiating substantially the remainder of the solar energy;
in which said grid comprises predeterminately sized pads of metal with spacing therebetween, with the size of said pads and said spacing, and the ratio of pad and spacing area being respectively adjusted to optimize respectively the transmittance of the electromagnetic energy and the reflectance of the solar energy, and to obtain a balance therebetween; and
in which said substrate has sun and reflector sides respectively facing away from and towards said reflector, and further comprising a second metallic capacitive grid formed similarly as said first-mentioned grid, said first and second grids being placed respectively on said substrate sun and reflector sides, with the center-to-center spacing respectively between said first and second grids being adjusted to optimize the electromagnetic tranmittance and solar energy reflectance.

4,479,132
THERMAL PRINTER
Sadao Iwakura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 269,972, Jun. 3, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,570
Claims priority, application Japan, Jun. 13, 1980, 55-78963
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH 6 Claims



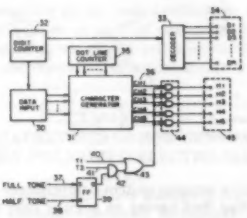
1. A thermal printer comprising:
(a) memory means for memorizing pattern information which has previously been printed by a thermal head;
(b) a D-A converter connected to said memory means;
(c) a comparator for comparing an output from an integrator and an output from said D-A converter;
(d) a latch connected to and controlled by said comparator, said latch applying an output therefrom to said integrator; and
(e) means for controlling printing of new pattern information by a signal memorized in said latch.

4,479,133
LIGHT BEAM ROTARY PRINTER
Etuo Shiozawa; Masahiro Ohnishi, and Shigeo Harada, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Saitama, Japan
Filed Mar. 8, 1982, Ser. No. 355,874
Claims priority, application Japan, Mar. 16, 1981, 56-37457
Int. Cl.³ G01D 15/14
U.S. Cl. 346—108 7 Claims



1. A light beam rotary printer comprising a rotator rotatable about the central axis thereof and carrying at least one light projecting section for outwardly projecting a light beam, a driving means for rotating the rotator about the central axis, a power supplying means for supplying power modulated by a desired modulating signal, a platen for supporting a recording medium opposed to the peripheral surface of the rotator to be exposed to the light beam projected by at least one light projecting section while the rotator is rotated and means for translating the rotator along the central axis and wherein each of said light beam projecting sections includes a plurality of light beam projecting systems each of which comprises a light source and a condenser lens system, the light beam projecting system being mounted so that the mechanical centers of all the light beam projecting systems in all the light beam projecting sections are positioned on a common circle in a plane perpendicular to the central axis of the rotator having its center on the central axis, and the optical axes of the light beam projecting systems in each light beam projecting section are arranged to intersect the recording medium on the platen at positions offset from each other in the direction of the central axis of the rotator.

4,479,134
ELECTRONIC DEVICE HAVING A THERMAL INK JET RECORDER
Tsuyoshi Kawanabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 133,302, Mar. 24, 1980, Pat. No. 4,353,079. This application Jun. 18, 1982, Ser. No. 389,919
Claims priority, application Japan, Apr. 2, 1979, 54-39474
The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 4 Claims



1. An electronic device for a dot printer, comprising:
a single recording element for recording character-like dot patterns on a recording medium;
a character generator for supplying character information to said recording element; and
control means responsive to first and second input signals for controlling the number of outputs from said character generator for a given recording position, wherein at a given recording position there is a single output from said character generator when said control means responds to the first input signal and there are plural outputs from said character generator when said character generator responds to the second input signal.

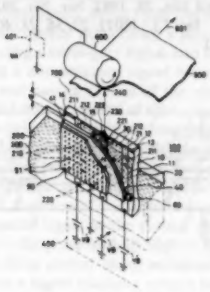
4,479,135
INK RECORDING APPARATUS
Tadao Kohashi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 22, 1982, Ser. No. 390,967
Claims priority, application Japan, Jul. 2, 1981, 56-104175
The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 8 Claims

1. An ink recording apparatus comprising:
a substrate,
a predetermined number of first electrodes disposed on a surface of said substrate in insulated relation with respect to each other and with a predetermined pitch between each other corresponding to a pitch of picture elements to be recorded,
an ink-philic porous sheet disposed on said substrate with said first electrodes inbetween,

a fluid ink-permeable second electrode disposed on a surface of said porous sheet which surface is opposite to the surface contacting said first electrodes,

a fluid ink feeding means for feeding said fluid ink to said ink-philic porous sheet,

said first electrodes and said second electrode being supplied with a signal voltage therebetween, thereby to carry out electroosmotic travelling of said fluid ink through said



porous sheet to tip parts of said first electrodes corresponding to said signal,

characterized in that

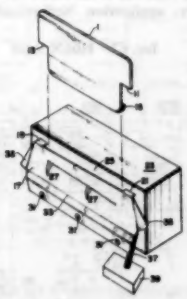
said first electrodes are of ink-philic conductive substance which are insulated and spatially separated from each other by a substantially ink-repellant and insulative substance provided at least at the tip parts of said first electrodes.

4,479,136

CLEANING SYSTEM AND METHOD FOR INK JET PRINTER

Arthur M. Lewis, and Aldo Scudo, both of Ridgefield, Conn., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 17, 1983, Ser. No. 467,422
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **23 Claims**



1. In an ink jet printer including a print head having at least one orifice upon its face, apparatus for cleaning contaminants from the face of said print head and from said orifice(s), comprises:

card guide means non-abuttably mounted upon the face of said print head; and

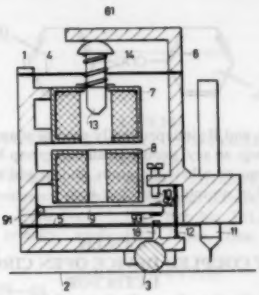
cleaning card means including cleaning solvent carrier means, said cleaning card means being adapted for permitting insertion thereof between the face of said print head and said card guide means, whereby said solvent carrier means wipes the face and said orifice(s) of said print head.

4,479,137

DAMPING MEANS FOR DRAWING HEADS

Lothar Beier, 22, Fritz-Ritter-Str., Jena-Lobeda, District of Gera; Arnold Zemann, 4, Dr.-Hufeland-Str., Stadtroda, District of Gera, and Helmut Wächter, 44, Rodaer Str., Neustadt-/Orla, District of Gera, all of German Democratic Rep.

Filed Jul. 13, 1981, Ser. No. 281,551
Claims priority, application German Democratic Rep., Oct. 1, 1980, 224253
Int. Cl.³ G01D *15/20*
U.S. Cl. 346—141 **3 Claims**



1. A damping means particularly for drawing heads comprising

a mount,

at least one support displaceable along one direction between a start position and an end position,

at least one drawing instrument secured to said support,

a first electromagnet being connected to said mount,

a core being in common orientation with said first electromagnet for common operation,

said core being connected to said support,

a second electromagnet being connected to said mount,

a lever being pivotly connected with one end portion to said mount,

said lever being provided with at least one contact face at the other end portion,

said second electromagnet and said lever being aligned for common cooperation,

a first stop being connected to said support,

said first stop and said contact face being aligned for common cooperation,

said first electromagnet and said core being for moving said support into an intermediate position,

said intermediate position being defined by said contact face and said first stop when said second electromagnet is operated,

first spring means for resiliently securing said support to said mount,

second spring means connecting said mount to said support for moving said support into an end position when said second electromagnet is not operative.

4,479,138

HEAT-SENSITIVE RECORDING MATERIALS

Kensuke Ikeda, and Akira Igarashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1982, Ser. No. 428,521
Claims priority, application Japan, Oct. 6, 1981, 56-159264
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—207 **7 Claims**

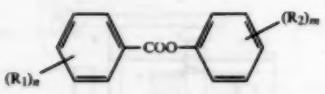
1. A heat-sensitive recording material comprising:

a support sheet having provided thereon:

electron donating dye particles having a particle size of 10 μm or less prepared from a dispersion wherein the dye is dispersed in a dispersion medium;

electron accepting compound particles capable of forming a color upon reaction with the electron donating dye and having a particle size of 10 μm or less prepared from a dispersion wherein the electron accepting compound is dispersed in the dispersion medium;

particles of a compound represented by general formula (I) having a particle size of 10 μm or less and being present in an amount of 20% to 300% by weight based on the weight of the electron accepting compound prepared from a dispersion wherein the compound of general formula (I) is dispersed in the dispersion medium:



(I)

wherein R_1 and R_2 independently represent an alkyl group, an aralkyl group, an aryl group, an alkoxy group having 12 or less carbon atoms or a halogen atom, and m and n independently represent 0 or an integer of 5 or less.

4,479,139

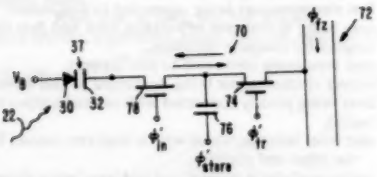
CHARGE COUPLED DEVICE OPEN CIRCUIT IMAGE DETECTOR

William J. Parrish, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 205,544, Nov. 10, 1980, abandoned. This application Jan. 19, 1983, Ser. No. 459,281

Int. Cl.³ H01L *29/78, 27/14, 31/00;* **H03K** *3/42*

U.S. Cl. 357—24 **5 Claims**



1. A charge transfer device imager comprising:

a photosensitive semiconductor diode comprising first and second regions of opposite conductivity types disposed to receive an incident flux of radiation, at least one of said regions being unconnected so that said diode has an open circuit junction voltage in the presence of radiation proportional to said radiation flux;

a capacitive electrode overlying said one unconnected region;

a charge transfer device comprising a charge flow channel formed in semiconductive material;

a charge storing region in said semiconductive material adjacent said charge transfer device and connected to said capacitive electrode;

means for removing a charge packet from the charge flow channel and storing it in said charge storing region to begin an integration period; and

means for retrieving at least a portion of said charge packet from said charge storing region to terminate said integration period and for returning said portion to said charge flow channel, wherein the difference between the charge removed from the charge flow channel and the charge returned to the charge flow channel by said removing and returning means is proportional to the change in said radiation flux during said integration period.

4,479,140

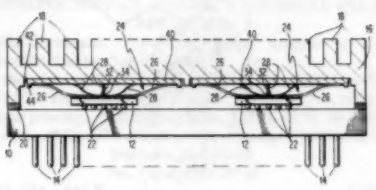
THERMAL CONDUCTION ELEMENT FOR CONDUCTING HEAT FROM SEMICONDUCTOR DEVICES TO A COLD PLATE

Joseph L. Horvath, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,918

Int. Cl.³ H01L *23/36, 23/40*

U.S. Cl. 357—81 **11 Claims**



1. A thermal bridge element for use in a semiconductor package to conduct heat from a semiconductor device mounted on a substrate to a cold plate in close proximity to the device comprising

a generally annular shaped spring member provided with a compressible bulged first central portion

a first flat plate member adapted to be disposed in contact with the back side of said device,

a means to join said first plate to said bulged first central portion of said spring member,

a second flat plate member adapted to be disposed in contact with said cold plate, and

a means to join said spring member and second plate member in contacting engagement.

4,479,141

COLOR TELEVISION CODING CIRCUIT

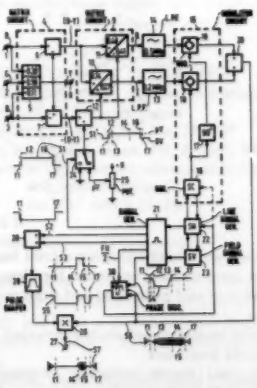
Nicolaas J. L. Van Der Valk, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,894

Claims priority, application Netherlands, May 29, 1981, 8102618

Int. Cl.³ H04N *9/38*

U.S. Cl. 358—12 **3 Claims**



1. A colour television coding circuit suitable for use in a

colour television system in accordance with the NTSC-standard, the coding circuit comprising a series arrangement formed by a first matrix circuit for forming colour difference signals, a second matrix circuit for forming standardized I- and Q-signals thereform, first and second low-pass filters following the second matrix circuit and having different frequency passbands for the I- and the Q-signal respectively, a modulator circuit following the filters for quadrature modulation of a chrominance subcarrier by the frequency-limited I- and Q-signals and a first superposition circuit following the modulator circuit for forming a chrominance signal from the modulated signals, the coding circuit further comprising a second superposition circuit for inserting a burst-gate signal into the series arrangement for obtaining a chrominance signal occurring at a coding circuit output and having a burst of the chrominance subcarrier during a standardized period of time, characterized in that the second superposition circuit for inserting the burst-gate signal is coupled to the second matrix circuit which is in turn coupled to the subsequent low-pass filters in the series arrangement, the duration of the inserted burst-gate signal being longer than the standardized duration of the chrominance subcarrier burst in the chrominance signal at the coding circuit output with the occurrence of the pulse leading edge of the burst-gate signal in the line blanking period being advanced, the coding circuit incorporating a signal blanking circuit having a first input for receiving the chrominance signal produced by the first superposition circuit, a second input for receiving a blanking signal which is active in a standardized line blanking period outside the standardized duration contained therein for the chrominance subcarrier burst, and an output connected to the coding circuit output for supplying the chrominance signal with the chrominance subcarrier burst during the standardized period of time.

4,479,142

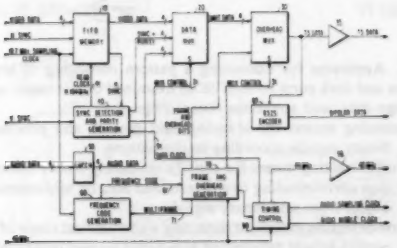
INTERFACE APPARATUS AND METHOD FOR ASYNCHRONOUS ENCODING OF DIGITAL TELEVISION

Bob D. Buschman, Gaithersburg; Glenn D. Muth, Frederick, and Ronald T. O'Connell, Germantown, all of Md., assignors to M/A-COM DCC, Inc., Germantown, Md.

Filed May 17, 1982, Ser. No. 379,382

Int. Cl.³ H04N *9/32, 9/42, 7/08*

U.S. Cl. 358—13 **12 Claims**



1. An interface for a video encoder arranged to output asynchronously DPCM encoded NTSC video and supplemental data in a T3 data format and rate for interfacing with encoded video sampled at an integer multiple of f_{sc} where f_{sc} is the color subcarrier frequency comprising:

a buffer with DPCM encoded video and video sync inputs, means to write video and video sync into said buffer in response to a sampling clock;

timing circuit control means responsive to a T3 rate clock for producing a data read clock at a submultiple of said T3 rate clock;

coupling means for coupling the data clock to said buffer for reading out said buffer memory at said data read clock rate to produce a data stream;

sync detection means responsive to a sync signal read from said buffer for inhibiting said coupling means for a predetermined time;

supplemental data generator means with an output coupled to a data multiplexing means for generating supplemental data;

data multiplexing means responsive to video data read from said buffer and to supplemental data from said supplemental data generator means for outputting said video data and supplemental data in time sequence;

whereby detection of a sync signal inhibits reading of said buffer for said predetermined time allowing insertion of said supplemental data.

4,479,143

COLOR IMAGING ARRAY AND COLOR IMAGING DEVICE

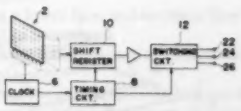
Takashi Watanabe, and Shigehiro Miyatake, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1981, Ser. No. 331,090

Claims priority, application Japan, Dec. 16, 1980, 55-181152[U]

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **8 Claims**



1. A color imaging device comprising:

(a) a color imaging array comprising:

(i) first type of elements sensitive to lights in a first region of spectrum;

(ii) second type of elements sensitive to lights in a second region of spectrum; and

(iii) third type of elements sensitive to lights in a third region of spectrum wherein

said three type of elements are aligned horizontally and vertically within a predetermined plane such that said first type of elements occupy every other element positions along both the horizontal and vertical directions, said second type of elements occupy element positions between the first type of elements in adjacent horizontal lines in pairs which occur every other pair of adjacent horizontal lines, and said third type of elements occupy remaining element positions, said first, second and third type of elements adapted for producing first, second and third color signals, respectively;

(b) shift register means connected to said color imaging array for sequentially shifting said color signals in the order of color signals in odd numbered horizontal lines from younger one and then color signals in even numbered horizontal lines from younger one, and for producing a serial color signal in said order;

(c) separating means connected to said shift register means for separating said serial color signal into three parallel

color signals of first color signal, second color signal and third color signal, said separating means comprising:

(i) first gate means for gating alternate color signal of said serial color signal, said first gate means producing first color signal;

(ii) second gate means for gating alternate color signal of said serial color signal in opposite relation to said first gate means, said second gate means producing a combined signal of second and third color signals;

(iii) delay means for delaying said combined signal by one horizontal line period; and

(iv) switching means having first and second contacts operatively provided such that each alternately changes its position in a synchronized manner with horizontal line period interval between a first position in which the contact is connected to said second gate and a second position in which the contact is connected to said delay means, said first and second contacts being operated in opposite relation to each other thereby said first contact producing second color signal and said second contact producing third color signal.

4,479,144

VIDEO PROJECTING APPARATUS

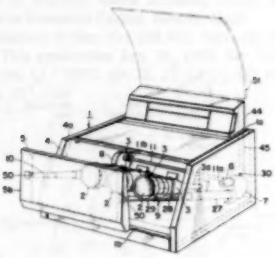
Shigeru Yamazaki, and Yoshiaki Takano, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,098

Claims priority, application Japan, May 1, 1981, 56-83646

Int. Cl.³ H04N *5/64*

U.S. Cl. 358—60 **4 Claims**



1. A video projecting apparatus comprising:

a housing-like chassis having front and rear portions, said chassis further having projection lenses and cathode ray tubes disposed therein for the projection of visual images from said tubes through said lenses;

a reflecting mirror having an inactive position at said front portion of said chassis;

a drive motor positioned within said chassis;

means for selectively actuating said drive motor in an extension direction and a contraction direction;

moving means positioned substantially within said chassis for moving said reflecting mirror relative to said chassis between said inactive position at said front portion of said chassis and an active position remote from and in front of said front portion of said chassis, said moving means including first and second drive sections driven by said drive motor, and first and second extension-contraction mechanisms disposed in parallel within said chassis and extending between said front and rear portions of said chassis, said first and second extension-contraction mechanisms being drivingly connected to said first and second drive sections, respectively, said reflecting mirror being affixed, at opposite sides thereof, to front portions of said first and second extension-contraction mechanisms, respectively, said drive sections moving said front portions of said extension-contraction mechanisms forwardly relative to said chassis when said drive motor is actuated in said extension direction;

said reflecting mirror being positioned in said active position by said moving means when said drive motor is actuated in said extension direction, and said reflecting mirror being returned to said inactive position by said moving means when said drive motor is actuated in said contraction direction; and

means for manually actuating said drive section, said means for manually actuating said drive sections including a rotatable operating lever, said lever being coupled with a drive shaft engaging said drive sections.

4,479,145

APPARATUS FOR DETECTING THE DEFECT OF PATTERN

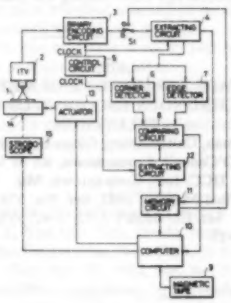
Toru Azuma, Tokyo; Junji Hazama, Kawasaki; Atsushi Kawahara, Kawasaki; Kazunari Hada, Kawasaki, and Norio Fujii, Urawa, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,681

Claims priority, application Japan, Jul. 29, 1981, 56-117816; Jul. 29, 1981, 56-117817; Jul. 29, 1981, 56-117818; Jul. 29, 1981, 56-117819; Jul. 29, 1981, 56-117820

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—106 **10 Claims**



1. Apparatus for examining a pattern consisting of bright parts and dark parts formed on an examined object based upon design data, said apparatus comprising:

scanning means for scanning said pattern and producing binary signals according to the pattern;

first extracting means for serially extracting binary information corresponding to a determined area on said examined object from said binary signals;

first detection means for detecting a geometrical shape of the pattern in said determined area based on said binary information;

second detection means for detecting the edge portion between the bright part and the dark part of the pattern in said determined area;

second extracting means for extracting from said design data information relating to the geometrical shape which said pattern should have; and

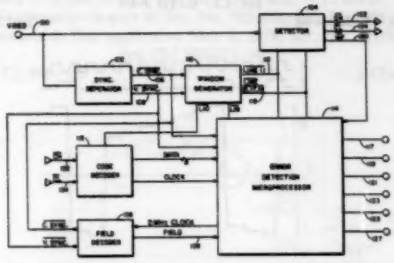
examination means for producing defect information indicative of the presence or absence of any defect in the pattern in said determined area in response to said second detection means when the information extracted by said second extracting means and the information detected by said first detection means agree with each other.

4,479,146

VERTICAL CODE VERIFIER

Steven J. Cohn, Manhattan Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Mar. 8, 1982, Ser. No. 355,944
Int. Cl.³ H04N 9/62
U.S. Cl. 358—147 13 Claims



1. Apparatus for verifying the presence of and proper placement of a plurality of code signals placed in the vertical blanking intervals of a segment of composite video information according to a predetermined procedure and pattern for code signal insertion, comprising:

code detector means for recovering said code signals from said composite video information;

sampling means for sampling the recovered code signals at discrete locations; and

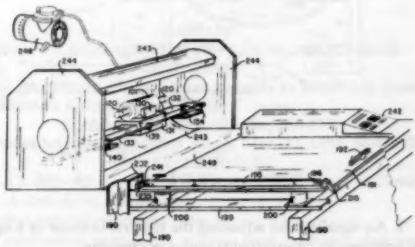
test means for comparing the sampling at a first one of said discrete locations with a subsequent sampling at a second one of said discrete locations, and including indicating means for generating an error signal representative of the detection of a discrepency between the characteristics of the relationship between the said first and second samplings and corresponding predicted characteristics according to said predetermined pattern.

4,479,147

METHOD OF AND APPARATUS FOR FEEDING AND POSITIONING MATERIAL TO BE SCANNED

Ernest M. Rossini, Springfield, Va., assignor to Crosfield Data Systems, Inc., Springfield, Va.

Filed Jun. 2, 1982, Ser. No. 384,366
Int. Cl.³ H04N 1/06
U.S. Cl. 358—290 17 Claims



1. In a scanning system:

scanning means rotating about an axis and moving laterally along said axis,

a flexible transport,

said transport having (a) a first face for receiving the material to be scanned, and (b) a second face,

a curved inner wall,

said curved inner wall being an arc of a circle with the center of such circle being on said axis,

drive means for moving said transport to a position where the second face of the transport is contiguous with said curved inner wall and said first face is positioned to permit scanning of material on said first face by said scanning means, and

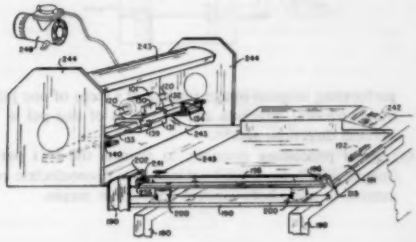
means for holding said second face against said curved inner wall, to permit accurate scanning of material on said first face.

4,479,148

METHOD AND APPARATUS FOR INSURING THAT THE TRANSPORT OF A SCANNING SYSTEM IS CONTIGUOUS WITH ITS SUPPORT

Wah Sheck, Olney, Md.; Daniel T. Beasley, Springfield, and Walter E. Myles, Alexandria, both of Va., assignors to Crosfield Data Systems, Inc., Springfield, Va.

Filed Jun. 2, 1982, Ser. No. 384,431
Int. Cl.³ H04M 1/06
U.S. Cl. 358—290 9 Claims



1. In a scanning system,

a transport having a lower face, and an upper face for holding the material to be scanned,

a base upon which the transport may rest while said material is being scanned,

said base having depressed areas spaced along one dimension of said transport, said depressed areas forming cavities bounded by the transport and said base, and

means for evacuating said cavities, with at least some of the cavities along said dimension being progressively evacuated, one after another as the distance along said dimension from one end of the transport increases, to thereby securely hold the transport in place on said base during scanning.

4,479,149

PHOTO-ELECTRIC CONVERTER AND IMAGE FORMING APPARATUS INCORPORATING THE SAME

Seishiro Yoshioka; Yutaka Hirai, both of Tokyo; Tadaji Fukuda; Masaki Fukaya, both of Kawasaki, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

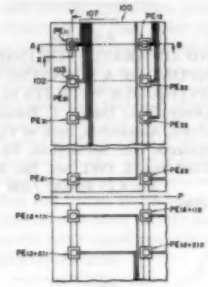
Filed Jun. 17, 1980, Ser. No. 160,160
Claims priority, application Japan, Jun. 25, 1979, 54-79858
Int. Cl.³ H04N 1/02, 1/10
U.S. Cl. 358—294 3 Claims

1. A photo-electric converter, comprising:

(a) photo-electric conversion means comprising m×n photo-electric conversion elements, each element being constructed with a layer of light receiving material and two electrodes and having a light receiving window which defines a pel, said elements being arranged two-dimensionally in an array of m ranks and n files, wherein the light receiving windows of said photo-electric conversion elements constituting a rank are arranged at a pitch of an integral number s of pels and the light receiving windows of said photo-electric conversion elements constitut-

ing a file are arranged at a pitch of an integral number t of pels;

(b) means for stepwise reading an original image at a resolution of s×n pels in the horizontal direction and t×m pels in the vertical direction and for forming s×t partial images on said m×n photo-electric conversion elements by



performing original image reading at s steps of one pel in the horizontal direction and at t steps of one pel in the vertical direction; and

(c) signal processing circuitry to process the s×t partial images which have been subjected to photoelectric conversion in said photo-electric conversion means.

4,479,150

METHODS AND ARRANGEMENTS FOR CHANGING THE AUDIO INFORMATION IN AN AUDIO/VIDEO RECORDING/REPRODUCTION SYSTEM

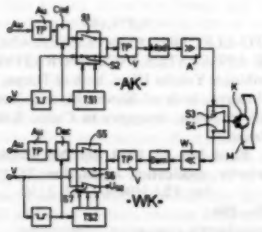
Andreas Ilmer, Ludwigshafen, and Karl Andreae, Beindersheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,265

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042269

Int. Cl.³ H04N 9/491

U.S. Cl. 358—310 **15 Claims**



1. A method for changing the audio information in an audio/video recording/reproduction system in which the audio/video signals are recorded on or reproduced from longitudinally extending tracks of a magnetic tape recording/reproduction system and in which the audio signals are inserted in the form of sampling pulses of a time-multiplex system into a blanking interval of the video signal, wherein the original audio signal recorded on the recording medium in the blanking interval is overwritten by a new audio signal.

4,479,151

MAGNETIC RECORDING OF DIGITAL SIGNALS ON A MAGNETIC MEDIUM

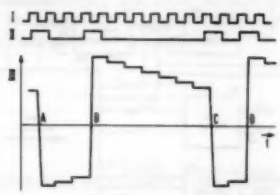
Herman Lia, Li, and Erik Solhjell, Oslo, both of Norway, assignors to Tandberg Data A/S, Oslo, Norway

Filed Mar. 30, 1982, Ser. No. 363,459

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112893

Int. Cl.³ G11B 5/09

U.S. Cl. 360—46 **10 Claims**



1. A method for the magnetic recording of encoded digital information signals on a magnetic recording medium with the assistance of a magnetic head to which a write current is supplied, comprising the steps of: as a function of the encoded digital information signals, carrying out a step-like head change from a first current value above zero to a second current value below zero and vice versa; and after each head change, varying an amplitude of the write current in stepwise amounts from the first or second current value respectively until a subsequent step-like head change, wherein the number of steps depends on a chronological spacing of the two head changes from one another, and the varying amplitude between head changes not crossing zero.

4,479,152

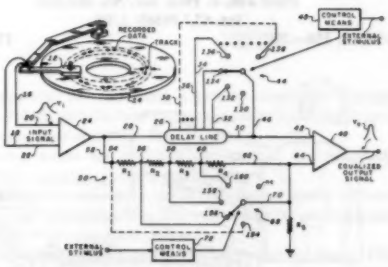
ADJUSTABLE EQUALIZER

Chao S. Chi, Shrewsbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,708

Int. Cl.³ G11B 5/09, 5/45

U.S. Cl. 360—46 **12 Claims**



1. An equalizer for adjusting the spectral contour of a signal in response to an external stimulus comprising,

delay means for delaying said signal by a time interval, thereby providing a delayed signal,

impedance means for attenuating said signal by an attenuation amount, thereby providing an attenuated signal,

differential means responsive to said delayed signal and said attenuated signal for providing an equalized signal whose spectral contour is a function of said time interval and said attenuation amount, and

control means responsive to said stimulus for adjusting at least one of said time interval and said attenuation amount,

thereby adjusting said spectral contour of said equalized signal in accordance with said stimulus.

4,479,153

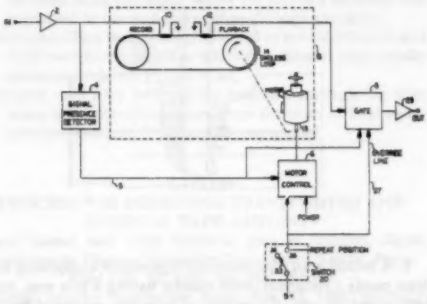
SQUELCH AND MESSAGE STORAGE SYSTEM AND METHOD

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Continuation-in-part of Ser. No. 708,203, Jul. 23, 1976, abandoned. This application May 9, 1979, Ser. No. 30,026

Int. Cl.³ H04B *1/10*

U.S. Cl. 360—53 **2 Claims**



1. A squelch system comprising;

(a) means for determining if a signal is present, including hang time means,

(b) means for delaying a signal using an electromechanical recording system said means delaying the signal for a period of time approximately equal to the hang time of the signal presence determining means,

(c) means for rapidly muting sounds when the signal presence determining means hang time period is completed indicating that signal is no longer present, and,

(d) means controlled by signal presence determining means for stopping the motion of the recording medium in a period equal to or greater than the approximate hang time of the squelch circuit so as to ensure that at least most of the noise tails that may be present at the input to the squelch system are not present at the output of the squelch system during subsequent transmissions.

4,479,154

FLOPPY DISK DRIVE WITH LOCAL PROCESSOR CONTROL

Kikuo Muramatsu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,875

Claims priority, application Japan, Mar. 23, 1981, 56-42787

Int. Cl.³ G11B *31/00*

U.S. Cl. 360—69 **4 Claims**

1. A disk drive comprising:

a disk capable of sorting data;

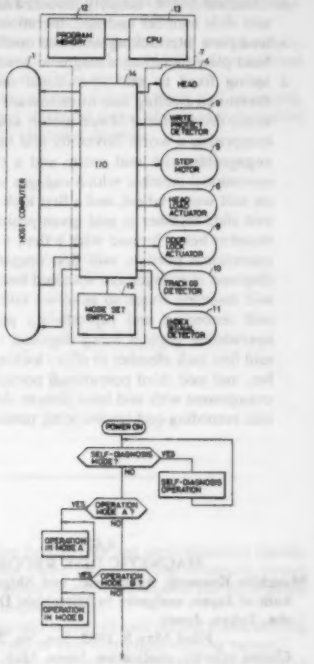
a mechanism section for writing data onto said disk and reading data out of said disk;

an I/O section arranged in a signal path between said mechanism and a host computer, for inputting and outputting signals;

a program memory section having stored therein programs corresponding to a plurality of data operation modes of said mechanism section;

a mode set switch independent of said host computer for applying said plurality of data operation modes to said I/O section through switch signals; and

a CPU section for interpretting a data operation mode inputted by said mode set switch, reading a program corresponding to said operation mode thus interpreted out of



said program memory section, and operating said mechanism section according to said program thus read.

4,479,155

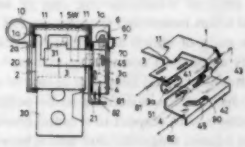
AUTO-LOADING MECHANISM IN A MAGNETIC RECORDING/REPRODUCING APPARATUS

Kazuki Takai; Hitoshi Okada, and Katsumi Yamaguchi, all of 50 Kamitoda, Toda-Shi, Saitama-ken, Japan

Filed Oct. 20, 1981, Ser. No. 313,363

Int. Cl.³ G11B *15/68, 15/18*

U.S. Cl. 360—96.5 **4 Claims**



1. A cassette auto-loading mechanism in a magnetic recording and reproducing apparatus comprising:

a motor for setting an inserted cassette to a recording and reproducing position;

a slide member for sliding to at least a given position responsively to insertion of a tape cassette in said apparatus;

a slidingly mounted operational member;

an engagement means for transmitting driving energy from

said motor to slidingly drive said operational member when said slide member arrives at said given position;

an insertion frame rotatably mounted and interlocking with said slide member and said operational member;

a head plate interlocking with said operational member, said head plate including a magnetic head mounted thereon;

a spring fixed to said operational member for applying thereto an ejecting bias force toward a direction opposite to the driving force of said motor, said engagement means comprising a worm driven by said motor, a worm wheel engageable with said worm and a rack formed on said operational member which engages with a gear provided on said worm wheel, and a first lock member for locking said slide member in said given position; said operational member being formed with a first, a second, and a third operational portion, said first operational portion being disposed in engagement with said insertion frame to rotate said insertion frame so as to set said inserted cassette in said recording and reproducing position, said second operational portion being disposed in engagement with said first lock member to effect locking of said slide member, and said third operational portion being disposed in engagement with said head plate to shift said head plate to said recording and reproducing position.

4,479,156

MAGNETIC DISK RECORDER

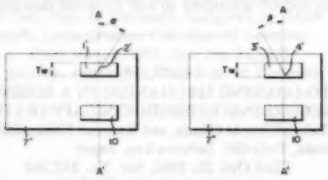
Munehito Kumagai, Amagasaki, and Shigehisa Suzuki, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,090

Claims priority, application Japan, May 11, 1981, 56-70555

Int. Cl.³ G11B *5/48, 21/02*

U.S. Cl. 360—104 **2 Claims**



1. A magnetic disk recorder comprising: a plurality of magnetic head chips, each of which is formed with a head gap having a predetermined azimuth angle; at least two separate head sliders, each of which having one of said plurality of magnetic head chips assembled thereon; and at least two separate actuators, each of which actuates a respective one of said head sliders by associated connecting means,

said azimuth angle of said head gap of one of said plurality of magnetic head chips is defined to be positive in a clockwise direction with respect to a radial line extending from the center of said magnetic disk and wherein said azimuth angle of said head gap of another of said magnetic head chips is defined to be negative in a clockwise direction with respect to said radial line, said magnetic head chips having said positive azimuth angle is assembled on one of said head sliders, while said magnetic head chip having said negative angle is assembled on another of said head sliders, wherein two of said magnetic head chips are arranged at a distance which is equal to a track pitch T_p and said head chips are moved by said actuators at $2 \cdot T_p$ steps in succession.

4,479,157

MOUNTING FOR A HEAD DRUM OF A HELICAL SCAN RECORDER

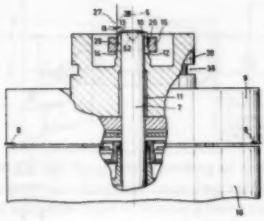
Petrus J. J. Aarts, Eindhoven, Netherlands; Harald Fleck, and Karl Kocsisek, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 144,730, Apr. 28, 1980,. This application Jun. 18, 1982, Ser. No. 389,536

Claims priority, application Netherlands, Sep. 5, 1980, 7903626

Int. Cl.³ G11B *5/48*

U.S. Cl. 360—104 **11 Claims**



1. A helical scan tape recorder/reproducer comprising an at least partly cylindrical drive spindle having a free end, rotatable about an axis of rotation; at least one magnetic head; a head support to which the magnetic head is secured, having a central bore for passage of the drive spindle therethrough with limited clearance, and means for detachably mounting the head support on the drive spindle near said free end,

said means for detachably mounting comprising a circular symmetrical clamping sleeve formed as a unitary part with and extending axially from the head support and having a free end, said sleeve having an elastically deformable wall portion concentric with said axis of rotation, and having an outer surface; and clamping ring means for deforming said sleeve to eliminate clearance between the drive spindle and the clamping sleeve,

characterized in that the clamping ring is a circular symmetrical unitary element deformed to be in tension, whereby exerting clamping pressure substantially uniformly over the circumference of said outer surface so as to cause symmetrical radial deformation of said clamping sleeve.

4,479,158

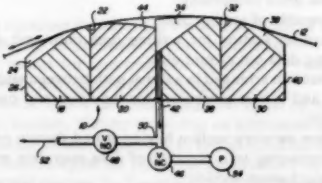
STATIONARY MAGNETIC HEAD WITH A FLUID OPERATED TAPE LIFTER

Frederick B. Froehlich, and Paul Y. Hu, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1982, Ser. No. 377,284

Int. Cl.³ G11B *15/60, 5/60, 15/64, 17/32*

U.S. Cl. 360—130.1 **26 Claims**



1. A magnetic head for sensing magnetic transitions from a flexible magnetic medium comprising:

a plurality of transducers situated on an operative face of the

head for sensing the magnetic transitions as the medium passes adjacent to the transducers;

said operative face having a plurality of slots, at least some of which are formed parallel to the motion of the medium and adjacent to the leading and trailing edges of the medium contact with the operative face;

means for introducing fluid under pressure between the medium and the operative face of the head; and

means connected to said fluid introducing means for controlling the fluid under pressure entering into said fluid introducing means;

said fluid introducing means, when actuated, introducing the fluid under pressure such that the medium forms into a tent-like structure over the operative face of the head with the fluid being contained within the tent-like structure and permitted to controllably escape through the slots;

said controlling means being actuated to provide fluid to said fluid introducing means when said medium is substantially stationary relative to said head;

wherein said fluid will quickly evacuate through the slots when said controlling means stops the entry of fluid under pressure into said fluid introducing means.

4,479,159

PROCESS FOR DETECTING TRANSPORTED AND RESIDUAL TAPE AMOUNTS

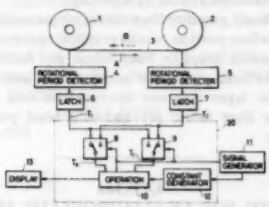
Kazuo Kamei, and Akira Orimoto, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,564

Claims priority, application Japan, Feb. 25, 1981, 56-26671; Feb. 27, 1981, 56-28113

Int. Cl.³ G11B *19/28*

U.S. Cl. 360—137 **11 Claims**



1. A process for determining the amount of transported or residual tape in either tape transportation direction of a reversible type tape recorder by using predetermined operation equations for calculating the amounts of transported and residual tape, respectively, comprising detecting respective rotational period data signals corresponding to the respective rotational periods of a pair of tape reels of said reversible type tape recorder, temporarily storing the data signals, operating on said stored respective data signals using said respective equations to produce outputs signals corresponding to at least one of said amounts of tape, and wherein said respective rotational period data signals which are operated upon by using said respective equations are exchanged with one another in response to a change in the direction of transportation of said tape.

4,479,160

BAND-PASS SEQUENCE FILTERS FOR SYMMETRICAL COMPONENTS OF MULTIPHASE AC POWER SYSTEMS

Eric J. Stacey, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 2, 1983, Ser. No. 490,697

Int. Cl.³ H02H *3/26*

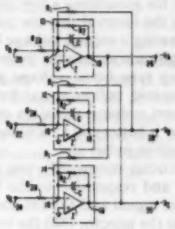
U.S. Cl. 361—76 **8 Claims**

1. A symmetrical component sequence filter for providing an output signal representative of a predetermined sequence quantity of a three-phase electrical power system, comprising:

a first phase shifting means having an input and an output, for shifting a first electrical signal of a preselected frequency by 120 electrical degrees;

a second phase shifting means having an input and an output, for shifting a second electrical signal of said preselected frequency by 120 electrical degrees;

a third phase shifting means having an input and an output, for shifting a third electrical signal of said predetermined frequency by 120 electrical degrees;



means for providing fourth, fifth and sixth electrical signals, responsive to the three phases of the electrical power system, to said inputs of said first, second and third phase shifting means respectively;

means for coupling said output of said second phase shifting means to said input of said first phase shifting means;

means for coupling said output of said third phase shifting means to said input of said second phase shifting means; and

means for coupling said output of said first phase shifting means to said input of said third phase shifting means.

4,479,161

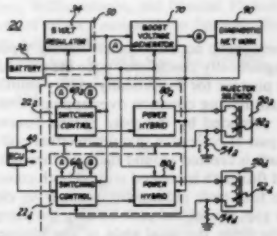
SWITCHING TYPE DRIVER CIRCUIT FOR FUEL INJECTOR

Robert S. Henrich, Farmington Hills, and John A. Walworth, Pontiac, both of Mich., assignors to The Bendix Corporation

Filed Sep. 27, 1982, Ser. No. 423,936

Int. Cl.³ H01H *47/04*

U.S. Cl. 361—154 **16 Claims**



1. A solenoid control unit (20) for controlling the operation of at least one fuel injector (50) of an engine, each injector (50) of the type having a coil (52), the solenoid control unit (20) responsive to metering signals generated by an electronic control unit (40) in response to at least one engine parameter, and wherein each fuel injector (50) has associated therewith a

sense means such as a resistor (52) for generating a voltage indicative of the current flowing within a particular injector (50), the solenoid control unit (20) comprising:

switching circuit means (60), one associated with each injector (50) adapated to receive a particular one of the metering pulses and communicated to a particular sense resistor (54) comprising:

pull-in signal generating means (62) for generating a pull-in signal in response to a received metering pulse;

on/off switch control means (90) for generating an on-control signal during intervals when the current of its corresponding injector is below a predetermined value and for generating an off-control signal when the injector current is above a predetermined value;

a voltage source network means (280) responsive to the pull-in signal for generating a first current reference level signal during the interval that the pull-in signal is present and for generating a second voltage level reference signal of lower magnitude during the interval thereafter;

pulsed switching type boost voltage generator means (70) responsive to said pull-in signal for generating and for storing a boost voltage signal in excess of the voltage established by a battery in synchronism with the generation of the pull-in pulse; and

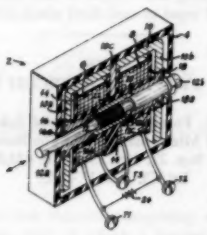
hybrid power circuit means (80), one associated with each injector (50) and responsive to the boost voltage signal, the on-control signal and the off-control signal for communicating to the injector (50) the boost voltage signal or battery potential in response to the on-control signal and for connecting the injector to a degeneration or recirculation circuit to permit the injector current to decay in response to the receipt of the off-control signal.

4,479,162

HIGH SPEED RECIPROCAL ELECTROMAGNETIC ACTUATOR WITH CANCELLED RETARDING-FLUX

Warren B. Offutt, Geneva, Ill., and Jerome K. Hastings, Sussex, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 9, 1982, Ser. No. 406,696
Int. Cl.³ H01H *51/22*; H01F *7/08*
U.S. Cl. 361—210 **21 Claims**



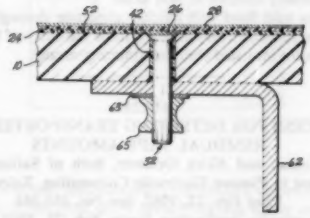
1. Electromagnetic actuator means having a pair of coaxial coils and magnetically continuous yoke means and comprising an armature plunger for reciprocally axially shuttling between magnetic paths having common overlapping portions through the plunger provided by the yoke means directing the flux paths of the pair of coils such that when either coil is energized a first flux path is created around that coil through the plunger and a second flux path is created around both coils through the plunger, the first path pulling the plunger to close an axial magnetic air gap, the second path holding the plunger in place, the flux paths from the axial ends of the plunger extending substantially only axially to the yoke means, the yoke means having a central leg extending radially between the coils, the leg having an inner end facing the plunger and separated therefrom by a radial gap, the axial length of the radial gap being no greater than the axial spacing of the coils, the ratio of the permeances of the two paths being controlled by electric circuit means such that one path always overpowers the other, preventing residual magnetic latching, to insure plunger movement in either direction without the need for mechanical assistance.

4,479,163

INTEGRAL LIGHTNING PROTECTION SYSTEM FOR COMPOSITE AIRCRAFT SKINS

Engbert T. Bannink, Jr., Auburn, and Glenn O. Olson, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01404, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO84/01487, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 30, 1982, Ser. No. 454,206
Int. Cl.³ H05F *1/02*
U.S. Cl. 361—218 **3 Claims**



1. An integral lightning protection system for an aircraft graphite epoxy structure having a fastener inserted therein, said fastener including a head portion facing an outer surface portion of said aircraft graphite epoxy structure, said integral lightning protection system comprising:

a nickel-plated graphite fiber fabric ply extending along said outer surface portion of said graphite epoxy structure, said nickel-plated graphite fiber fabric ply further extending over said head portion of said fastener; and,

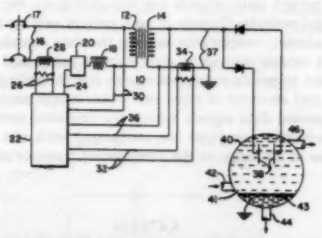
a dielectric layer disposed intermediate said nickel-plated graphite fiber fabric ply and said head portion of said fastener.

4,479,164

CONTROL FOR AN ELECTROSTATIC TREATER

Leon S. Siegel, Sand Springs, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 9, 1982, Ser. No. 443,076
Int. Cl.³ B03C *9/00*
U.S. Cl. 361—235 **13 Claims**



1. An automatic voltage control system for limiting the power delivered to a grid of an electrostatic oil dehydrator so as not to exceed rated power of a step-up transformer by controlling the voltage applied to the primary winding of the step-up transformer, the secondary winding thereof energizes the grid of the electrostatic oil dehydrator, comprising:

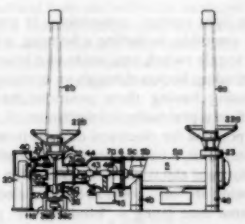
(a) the step-up transformer having a primary winding and a secondary winding with the primary winding connected to an alternating current voltage source and the secondary winding connected across the grid of the electrostatic oil dehydrator;
(b) means for measuring the current passing through the primary winding of the step-up transformer;
(c) means for measuring the voltage across the primary winding of the step-up transformer;
(d) a solid state switch in series with the primary winding of the transformer;
(e) means for comprising the current passing through the primary winding as measured by the current measuring means to a predetermined first primary current limit set point, the comparing means having a first input port for receiving the measured primary current from the primary current measuring means, a second input port for receiving the first primary current limit set point and an output port at which the compared current signal is presented; and
(f) voltage control circuit means responsive to the compared current signal and responsive to the voltage measured by the voltage measuring means for inhibiting the solid state switch from triggering upon detecting a primary current limit has been reached, whereby when power delivered to the oil dehydrator is limited by a current limit, the magnitude of the voltage applied to the primary winding is reduced to zero to permit the current limit condition to clear and then voltage is reapplied to the primary winding until another limiting condition occurs requiring repeating the control action.

4,479,165

GAS INSULATED SWITCHING APPARATUS

Isao Kamata, Sagamihara, and Satoshi Ohyama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 4, 1982, Ser. No. 345,673
Claims priority, application Japan, Feb. 6, 1981, 56-15647; Feb. 27, 1981, 56-26908
Int. Cl.³ H02B 1/04
U.S. Cl. 361—335 **9 Claims**



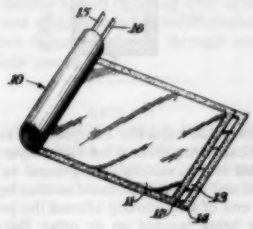
5. A gas insulated switching apparatus comprising a circuit breaker including a horizontal grounded tank containing a sealed insulating gas and a circuit breaker section accommodated in said grounded tank and having one terminal section, a first bushing exposed to the atmosphere disposed upright on one side of said tank at a first end of said tank, said first bushing having a center conductor extending therein and connected to said one terminal section, a disconnecting switch including a second tank disposed in the axial direction of and adjacent to a second end of said horizontal grounded tank, said second tank being isolated from said horizontal grounded tank by first gas-tight means and containing a sealed insulating gas and a disconnecting switch section, a bushing support tank disposed in the axial direction of and adjacent to the end of said second tank opposite said circuit breaker, said bushing support tank being isolated from said second tank by second gas-tight means and containing a sealed insulating gas, a second bushing exposed to the atmosphere disposed upright on top of said bushing support tank, a removable conductor, and a lightning arrester, said lightning arrester being coupled to said bushing support tank and isolated therefrom by gas-tight means, the other terminal section of said circuit breaker being connected to one terminal of said disconnecting switch section via a conductor passing through said first gas-tight means, the other terminal of said disconnecting switch section being connected to a fixed contact of said grounding switch and also to a center conductor extending in said second bushing via a conductor passing through said second gas-tight means, and the center conductor in said second bushing being connected to an inner element of said lightning arrester via said removable conductor.

4,479,166

HIGH TEMPERATURE ELECTROLYTIC CAPACITOR

Manuel Finkelstein, North Adams; Franz C. Dunkl, and Sidney D. Ross, both of Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 306,994, Sep. 30, 1981, Pat. No. 4,373,177. This application Jul. 19, 1982, Ser. No. 399,165
Int. Cl.³ H01G 9/00
U.S. Cl. 361—433 **5 Claims**



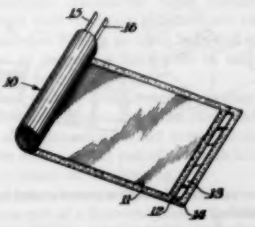
1. A high-temperature aluminum electrolytic capacitor comprising two aluminum electrode foils, one of said foils bearing a barrier layer dielectric oxide, interleaved spacers wound throughout the length of said foils in contact with an electrolyte consisting essentially of ethylene glycol as solvent, water, a phosphate ion source, and as solute a tert.butylammonium adipate corresponding to 1.3 to 2.0 moles of tert.butylamine per mole of adipic acid, thereby providing a capacitor capable of operating at 200 VDC or higher and at 130° C., said electrolyte having a room-temperature resistivity of at least 600 Ω-cm.

4,479,167

ELECTROLYTIC CAPACITOR

Sidney D. Ross, Williamstown, and Manuel Finkelstein, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 1, 1983, Ser. No. 519,456
Int. Cl.³ H01G 9/00
U.S. Cl. 361—433 **6 Claims**



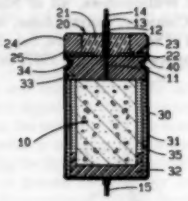
1. An electrolytic capacitor comprising a pair of aluminum

foil electrodes, at least one bearing a barrier layer dielectric oxide on its surface, contiguously wound with interleaved spacer material and in contact with an electrolyte consisting essentially of 79–95 wt. % of an azeotrope of an acid and an organic amine, 5–20 wt. % water, 0–5 wt. % of a depolarizer, and up to 1 wt. % phosphoric acid, said acid being selected from acetic acid and propionic acid and said amine being selected from triethylamine and tri-n-propylamine.

4,479,168
ELECTROLYTIC CAPACITOR WITH A HERMETIC SEAL

Gilbert E. Green, Jr., Bennington, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 19, 1983, Ser. No. 562,931
Int. Cl.³ H01G *9/06, 9/10*
U.S. Cl. 361—433 **16 Claims**

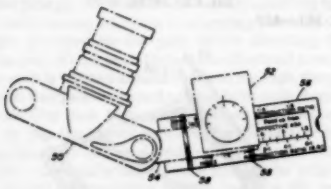


1. An electrolytic capacitor comprising a metal housing, an electrolytic capacitor section, an electrolyte and a hermetic glass-to-metal seal in sealing engagement on an end of said housing, said seal having a flat metal washer bonded on one flat side to said end of said housing around the periphery of both, said washer being bonded on its other flat side to a metal compression ring of the same outside diameter as said washer adjacent the outer periphery of said washer and completely along a bottom surface of said ring, said ring having an aperture therein, said aperture of said ring being of greater inside diameter than the aperture of said washer whereby said washer extends inwardly beyond said ring, a body of glass abutting said ring and said washer, said body having an aperture therein through which a hollow tube extends, said glass being bonded to said washer and said tube, and said ring radially compressing said glass.

4,479,169
CALCULATOR AND APPARATUS FOR MACROPHOTOGRAPHY

Ralph Holmes, 216 Diana Dr., Burley, Id. 83318

Continuation of Ser. No. 240,842, Mar. 5, 1981, Pat. No. 4,361,752. This application May 13, 1982, Ser. No. 377,960
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—5 **13 Claims**



1. An apparatus for use with a camera used in macrophotography comprising:

an electronic flash unit having a variable power output;

bracket means for supporting the flash unit and for connecting the flash unit to the camera in such manner that an angle formed between an axis passing through a lens of the camera and an axis passing through the flash unit is adjustable; and

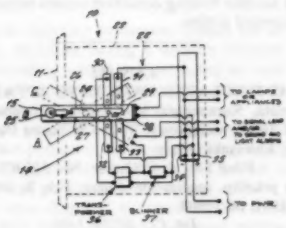
a calculator device for calculating a desired power ratio setting for the flash unit for a particular set of exposure parameters, the exposure parameters including a reproduction ratio representative of the ratio between the actual size of an object being photographed and the size of an image on film, a desired film sensitivity, a desired lens opening size, and a flash to object distance;

wherein said calculator device comprises first scale means for correlating the reproduction ratio and the desired film sensitivity to obtain an effective film sensitivity, second scale means for correlating the effective film sensitivity and the desired lens opening, and third scale means responsive to the correlation of the effective film sensitivity and the desired lens opening by said second scale means and responsive to the flash to object distance for displaying the desired power ratio setting.

4,479,170
GUIDING LIGHT SYSTEM

Bobby J. Richardson, 2303 Cottonwood, Norman, Okla. 73071

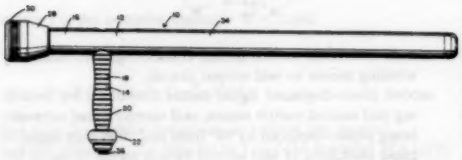
Filed May 9, 1983, Ser. No. 493,069
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—95 **1 Claim**



1. A guiding light system, comprising, in combination, an electric switch assembly, including a housing, a front plate on said housing, a toggle switch unit inside said housing having an outwardly protruding button through an opening in said front plate, said housing having three positions into which said button is selectively pivotable; a lowermost of said positions being an "off" position for electrical devices powered through said toggle switch unit, a middle one of said positions being an "on" position for said electrical devices, and an uppermost of said positions being an "off" position for said electrical devices while at the same time being a "blinking on" position for a remotely located signal lamp and a lamp on said button, said lowermost position being a "steady lighted on" position for said signal lamp and said button lamp, and said middle position being an "off" position for said signal lamp and said button lamp; said button being affixed on one end of a pivoted rocking lever, a contact plate affixed on an opposite end of said lever for selectively providing circuit closure means between a first pair of spaced-apart, stationary contacts of a power circuit to said electrical devices or providing circuit closure means between a second pair of spaced-apart, stationary contacts of a power circuit to said signal lamp; said button lamp being connected to a pair of contacts carried on said rocking lever, and which are selectively engagable either with a third or a fourth pair of stationary contacts, said third pair being in a power circuit including a step down transformer, and said fourth pair being in a power circuit including a blinker unit and a step down transformer; said first pair of contacts being engaged by said contact plate when said button is in said middle position, said second pair of contacts being engaged by said contact

plate when said button is in said uppermost position, said third pair of contacts being engaged by said lever-carried contacts when said button is in said lowermost position, and said fourth pair of contacts being engaged by said lever-carried contacts when said button is also in said uppermost position.

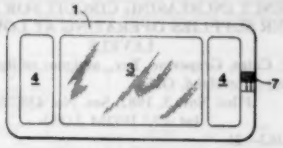
4,479,171
SIDE ARM BATON AND FLASHLIGHT
Gregg B. Mains, 244 Centenial, Rancho Mirage, Calif. 92770
Filed Aug. 25, 1983, Ser. No. 526,458
Int. Cl.³ A63B *15/02*
U.S. Cl. 362—102 **9 Claims**



1. The combination of a side-handle baton and flashlight permitting one-handed operation thereof which comprises:
(a) an elongated tubular club;
(b) a short side-handle at right angles thereto attached medially on said club approximately ⅛ to ⅓ its length from one end, thereby forming short end and long end portions of said baton;
(c) an electrical bulb and reflector mounted in the short end portion, a lens and protective lens holder received over said bulb and reflector and removably attached to the short end portion of said baton;
(d) an electrical storage battery located in said elongated tubular club;
(e) an electrical switch mounted in the end of said side-handle; and
(f) electrical conductor means in circuit with said switch, battery and bulb.

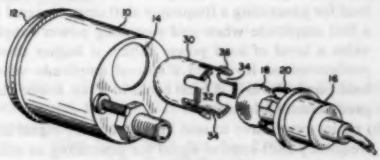
4,479,172
ILLUMINATED MIRROR ASSEMBLY
John Connor, c/o Clearplas Limited, Bayton Rd., Exhall, Coventry, England (CV7 9EL)
Filed Dec. 2, 1982, Ser. No. 441,739
Claims priority, application United Kingdom, Nov. 13, 1981, 8134348; Feb. 17, 1982, 8204657; Apr. 2, 1982, 8209820
Int. Cl.³ F21V *33/00*; B60Q *3/02*
U.S. Cl. 362—135 **2 Claims**

1. A mirror assembly comprising a shallow dish-like housing having a flat base and walls upstanding therefrom around the whole of the periphery of said base, said walls having internal surfaces inclined at an obtuse angle with respect to said base; at least one pair of elongate conductors together defining an electrically-conductive seating for at least one electric lamp to be mounted therebetween within said housing; said conductors extending within the interior of said housing to terminal connectors, whereby connection to an electrical supply externally of said housing can be effected; a frame detachably secured around the periphery of said housing and defining a first aperture; a mirror mounted in said first aperture and facing outwardly of said housing; said frame defining at least one second aperture; a lens mounted in each said second aperture through which light from each said lamp, when fitted between said conductors and energized, is directed by said lens to illuminate a region in front of said mirror, said mirror spaced from the interior of the base of said housing, each said lamp positioned



wholly between said mirror and said base of the housing and directly behind the mirror, the rear surface of said mirror and at least said internal surfaces of said walls of said housing being reflective whereby light emitted by each said lamp is reflected at least once before passing through at least one of said lenses to be directed thereby to said region in front of the outer face of said mirror and wherein said electrical conductors include apertures formed therethrough and through which incident and reflected light passes.

4,479,173
LIGHTED INSTRUMENT ASSEMBLY
George E. Rumpakis, 3520A SW. 209th, Aloha, Oreg. 97007
Continuation of Ser. No. 487,328, Apr. 21, 1983, abandoned. This application Oct. 27, 1983, Ser. No. 546,171
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—294 **1 Claim**



1. A lighted instrument assembly comprising
a housing having a face portion at one end and a bulb receiving aperture at the other end,
a bulb holder having a socket end for removably receiving a light bulb,
a plurality of spaced spring tabs projecting from the socket end of said bulb holder and frictionally engageable in said bulb receiving aperture for holding said bulb holder on said housing with the end of the bulb holder adjacent the end of said housing and the light bulb projecting into said instrument,
a hollow colored translucent body member projecting through said bulb receiving aperture into said housing,
said body member having an open base end and being of a dimension to receive a light bulb in said bulb holder through said base end thereof,
said base end of said body member having spaced slots therearound extending toward the other end of said body member and dimensioned and arranged to receive the spring tabs on the socket end of said bulb holder when the latter is mounted on the housing,
said body member having a radial outwardly turned flange on said base end of a diameter greater than the diameter of said bulb receiving aperture whereby to limit inward movement of said body member in said aperture and also

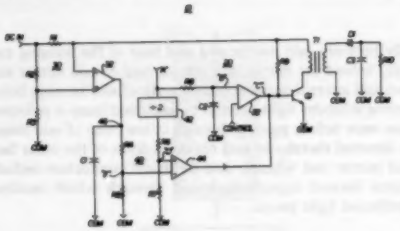
to provide clamped mounted engagement thereof between the socket end of said bulb holder and said other end of the housing,

said slots in the base end of said body member being longer than said flexible tabs on said bulb holder to provide openings which allow air circulation through said bulb cover and said bulb holder.

4,479,174
EFFICIENCY INCREASING CIRCUIT FOR SWITCHING POWER SUPPLIES OPERATING AT LOW POWER LEVELS

Robert P. Cates, Grapevine, Tex., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Nov. 3, 1982, Ser. No. 438,798
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **8 Claims**



1. An efficiency increasing circuit adapted for use in a switching power supply of the type which utilizes pulse width modulation to generate, from a source of high frequency signals having predetermined waveform, pulses whose width is dependent on the load connected to said supply to thereby provide from an input voltage power to said load, said efficiency increasing circuit comprising:

(a) means responsive to the power being provided to said load for generating a frequency shift control signal having a first amplitude when said switching power supply provides a level of load power which is higher than some predetermined level and a second amplitude when said load power level is at least equal to if not lower than said predetermined level;

(b) means responsive to said high frequency signal and said frequency shift control signal for generating an efficiency increasing signal having a first and substantially constant waveform when said frequency shift control signal has its first amplitude and a second waveform which is related to the predetermined waveform of said high frequency signal when said frequency shift control signal has its second amplitude; and

(c) means for connecting said efficiency increasing signal to said pulses, said efficiency increasing signal having no effect on said pulses when said frequency shift control signal has said first amplitude and said efficiency increasing signal eliminating pulses in a predetermined manner when said frequency shift control signal has said second amplitude thereby increasing the efficiency of said supply.

4,479,175
PHASE MODULATED SWITCHMODE POWER AMPLIFIER AND WAVEFORM GENERATOR

Robert A. Gille, St. Paul; Norman G. Planer, Annandale, and Zoltan Zansky, Roseville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 13, 1982, Ser. No. 407,863
Int. Cl.³ H02M *1/14*
U.S. Cl. 363—41 **13 Claims**

1. A phase modulated switchmode amplifier apparatus comprising:

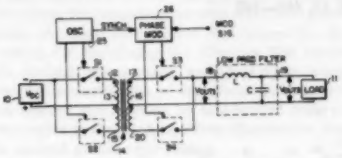
input power terminals adapted to be connected to a source of electrical power;

transformer means having primary winding and secondary winding means;

first electronic switch means for connecting said primary winding means to said input power terminals;

reference signal means connected for selectively switching said first switch means so that an alternating type current is induced in said secondary winding means;

an output circuit adapted to be connected to suitable load means;



second electronic switch means connecting said secondary winding means to said output circuit;

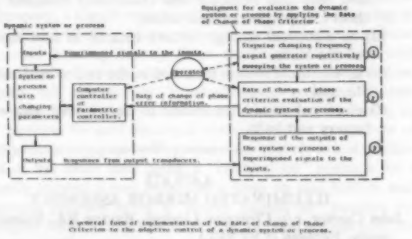
second phase-displaced signal means connected for switching said second switch means, said second signal normally being phase-displaced by 90° from said reference signal to cause switching of said second switch means to occur 90° displaced from the switching of said first switch means; and,

phase modulation means connected to said second signal means for shifting the phase displacement of said second signal to 90°±ρ° in response to a modulation signal where ρ is any number of degrees from 0 to 90°.

4,479,176
ADAPTIVE CONTROL OF A DYNAMIC SYSTEM OR PROCESS

Kenneth P. Grimshaw, Christchurch, New Zealand, assignor to Metalogic Control Limited, Christchurch, New Zealand

Filed Feb. 8, 1982, Ser. No. 347,046
Claims priority, application New Zealand, Mar. 11, 1981, 196476
Int. Cl.³ G05B *13/02*
U.S. Cl. 364—148 **8 Claims**



A general form of implementation of the Rate of Change of Phase Criterion in the adaptive control of a dynamic system or process.

1. An industrial control system having an adaptive control in which a control means compares at least one parameter of the control system with at least one predetermined value to produce an output signal to control each parameter and in which each parameter can be described mathematically as having dominant eign values and which utilize a rate of change of phase with frequency criterion under the following conitions:

$$\text{when } \phi = 0, \lim_{\omega \to 0} (d\phi/d\omega) = \frac{C_1}{C_0} \qquad (1)$$

$$\text{when } \phi = \pi/2, 3\pi/2, S\,\pi/2 \ldots$$

-continued

$$\text{when } A = 0,\ M = \frac{1}{B} \text{ and } (d\phi/d\omega) = \frac{-\left(\frac{dA}{d\omega}\right)}{B} \tag{2}$$

when $\phi = \pi, 2\pi, 3\pi \ldots$

$$\text{then } B = 0,\ M = \frac{1}{A} \text{ and } (d\phi/d\omega) = \frac{\frac{dB}{d\omega}}{A} \tag{3}$$

and (1), (2) and (3) are equal and
where the transfer function corresponding to the linear differential equation is expressed as

$$\frac{z}{y} = \frac{1}{A + jB}$$

where j is the complex operator $\sqrt{-1}$ and

$$A = C_0 - C_2\omega^2 + C_4\omega^4 - C_6\omega^6 + \ldots$$

$$B = C_1\omega^1 - C_3\omega^3 + C_5\omega^5 - C_7\omega^1 + \ldots$$

and ω is the angular frequency in radians per second;
ϕ the phase lag of z relative to y and the modulus $M = |z/y|$ are given by

$$\phi = \tan^{-1}\left(\frac{B}{A}\right) \text{ and } M = \frac{1}{\sqrt{A^2 + B^2}}$$

said industrial control system further comprising a memory means having stored therein the values for at least one control parameter based on a rate of change of phase with frequency criterion; means for measuring the current value of each control parameter; and means for comparing a stored control parameter with the current value of each parameter to produce an output signal, and means, responsive to said output signal, for controlling the industrial system to produce a desired optimum performance thereof.

4,479,177

SERVOMECHANISMS

Eugenio Berti, Falkland, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 324,351, filed as PCT GB 81/00202, Sep. 24, 1981, published as WO 82/01264, Apr. 15, 1982, § 102(e) date Nov. 17, 1981, abandoned. This application Nov. 17, 1981, Ser. No. 322,119

Claims priority, application GB81/00202, Sep. 24, 1981, PCT/GB/81/00203; United Kingdom, Sep. 30, 1980, 8031489

Int. Cl.³ G05B *23/00*

U.S. Cl. 364—159 **16 Claims**

1. A feedback servomechanism for controlling an attribute of a load, said servomechanism comprising:

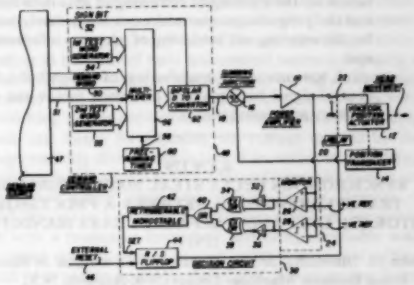
a summing junction coupled to receive a control signal as an additive input, coupled to receive a feedback signal indicative of said controlled attribute as a subtractive input, and operable to provide an output representative of the difference between said additive input and said subtractive input;

a power amplifier, coupled to receive said output of said summing junction as input and operable to provide an output representative thereof, said output of said power amplifier being coupled to said load to alter said attribute for the difference between said feedback signal and said control signal to be moved towards zero;

a test signal generator coupled to monitor an externally provided demand signal and operable to provide, as output, a test signal having the same polarity as said demand signal, said test being of sufficient magnitude to saturate said output of said power amplifier in the absence of said feedback signal;

demand control means coupled to receive said output of said test signal generator as a first input, coupled to receive said externally provided demand signal as a second input and operable to provide, as output, said control signal to said summing junction, where said control signal consists in said demand signal repetitively replaced by said test signal;

monitor means, coupled to monitor the state of saturation of said output of said power amplifier and operable to provide an output indicative of said output of said power amplifier failing to alter its state of saturation in response to said replacement of said demand signal by said test signal as said control signal;-and



load drive inhibition means, coupled to receive said output of said monitor means, coupled to control the delivery of energy to said load from said output of said power amplifier, and operable in response to the receipt of said output from said monitor means to cause the cessation of said supply of energy to said load from said output of said power amplifier.

4,479,178

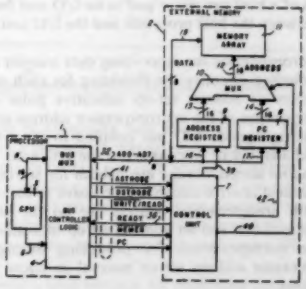
QUADRUPLY TIME-MULTIPLEX INFORMATION BUS

John Schabowski, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1981, Ser. No. 279,878

Int. Cl.³ G06F *9/30*

U.S. Cl. 364—200 **7 Claims**



1. A digital processor system comprising:

memory, means for storing of information;

processor means for entering and extracting information from the memory means under the control of a predetermined program sequence;

interface means coupled between said processor means and memory means for providing a conduit for information transfer said interface means comprises;

control means, responsive to said processor means, for providing at least a first control signal having a first state and a second state;

information bus means for transferring of data and program information between said processor means and said memory means under the control of the processor means and

memory addressing means including an address register responsive to the control signal when at a first state and a program counter register responsive to the control signal is incremented when the control signal is at a second state, the address register addresses the memory means for the entering or retrieving of data information and the program counter addresses the memory means for the entering and retrieving of program information; and

control bus means for transferring of at least the first control signal between said processor means and said memory addressing means.

4,479,179

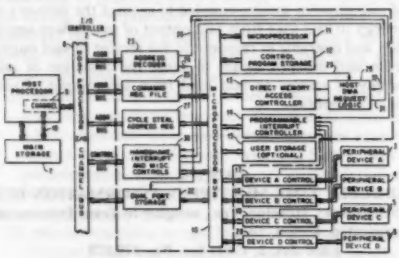
SYNCHRONOUS CYCLE STEAL MECHANISM FOR TRANSFERRING DATA BETWEEN A PROCESSOR STORAGE UNIT AND A SEPARATE DATA HANDLING UNIT

John M. Dinwiddie, Jr., Loxahatchee, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 62,262, Jul. 30, 1979, abandoned, which is a continuation of Ser. No. 321,132, Nov. 13, 1981, Pat. No. 4,417,304. This application Oct. 13, 1981, Ser. No. 310,010

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **3 Claims**



1. An I/O controller adapted to be coupled to the I/O channel bus of a host processor and to an I/O unit for transferring data between the host processor and the I/O unit and comprising:

a microprocessor for supervising data transfer activities and including circuitry for providing for each of its machine cycles an address set-up indicative pulse denoting the occurrence of the microprocessor address set-up interval;

a microprocessor I/O bus coupled to the microprocessor and adapted to be coupled to the I/O unit;

a random access storage mechanism for storing data;

cycle steal control circuitry responsive to the occurrence of both predetermined address bits on the host processor channel bus and an address set-up indicative pulse from the microprocessor for producing during the microprocessor address set-up interval an allow host connect signal;

address selector circuitry for selectively transferring address bits from either the microprocessor bus or the host processor channel bus to the address circuitry of the random access storage mechanism and responsive to the occurrence of the allow host connect signal for selecting the host processor address bits for such transfer;

first data transfer circuitry responsive to the occurrence of the allow host connect signal for providing a data transfer path between the host processor channel bus and the random access storage mechanism;

and second data transfer circuitry operative during the absence of the allow host connect signal for providing a data transfer path between the random access storage mechanism and the microprocessor bus.

4,479,180

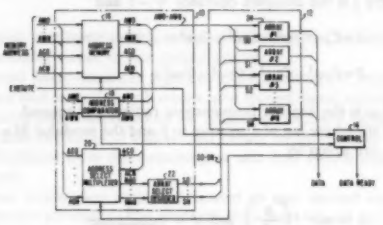
DIGITAL MEMORY SYSTEM UTILIZING FAST AND SLOW ADDRESS DEPENDENT ACCESS CYCLES

Leigh G. Miller, Baltimore, and Joel E. Lawhon, Catonsville, both of [illegible] assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 156,941, Jun. 6, 1980, abandoned. This application May 11, 1983, Ser. No. 492,367

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **4 Claims**



1. A memory system including a plurality of arrays responsive to a multi-bit digital address signal and to a pulsed execute signal to communicate with a selected storage location within a selected one of said arrays, comprising:

(a) a plurality of memory arrays, each of said plurality of memory arrays having a plurality of selectable storage locations; an array address input port and decode logic for accepting and decoding a multi-bit digital location select signal, to select a desired storage location within the array in response to a predetermined bit pattern of said multi-bit digital location select signal; and an array enable logic signal port for accepting as an input a single bit digital array enable signal with one logic level enabling the selection of one of said selectable storage locations of the array and the other level disabling the selection of any storage location in the array;

(b) array decode logic means for accepting a multi-bit digital array select signal, said array decode logic means including means to decode said multi-bit digital array select signal to generate and couple said digital array enable signal to one array of said plurality of arrays;

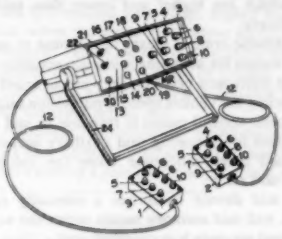
(c) address compare and control means responsive to said multi-bit address signal and said pulsed execute signal to generate a digital data ready signal after a first delay period following a first selected pulse of said pulsed execute signal whenever a bit of said location select signal has changed during the time interval between said selected pulse of said pulsed execute signal and the immediately preceding pulse of said pulsed execute signal and after a second delay period following a second selected pulse of said pulsed execute signal whenever all bits of said location select signal have remained the same during the time interval between said second selected pulse of said pulsed execute signal and the immediately preceding pulse of said pulsed execute signal, said first delay period exceeding in duration said second delay period.

4,479,181

ELECTRONIC CONTROL DEVICE FOR DECISIONS AND SCORING

James T. Hannah, 1 Cooinda Ct., Salisbury Heights, South Australia, 5158, Australia

Filed Sep. 3, 1981, Ser. No. 299,074
Claims priority, application Australia, Sep. 4, 1980, PE5416
The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.
Int. Cl.³ G06F *15/44*; G08B *23/00*
U.S. Cl. 364—411 9 Claims



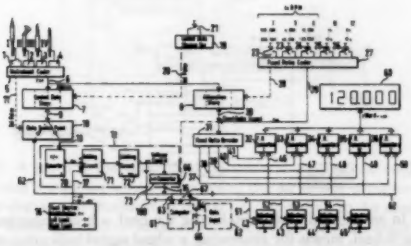
1. An electronic device for decisions and scoring comprising at least three control boxes, each having designated decision members each switchable between two logic states by a person to indicate a decision or score, an indicator panel forming part of one of said boxes having energizable indicator means designed to correspond to the decision members, audible indicator means connected to the said indicator panel, and electronic digital logic circuitry means between the decision members in the control boxes and the energizable indicator means in the panel, the digital logic circuitry means being arranged to actuate the indicator means when similarly designated decision members situated in at least two separate control boxes are actuated to establish a predetermined logic pattern in the said logic circuitry means whereby the indicator means indicates the logic pattern of such actuated decision members, and the audible indicator means being arranged to be actuated when a selected condition of said logic pattern occurs.

4,479,182

DENTAL TREATMENT APPARATUS

Stefan Beier, Biberach an der Riss, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,627
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114023
Int. Cl.³ G06F *15/20*; A61C *19/02*
U.S. Cl. 364—413 4 Claims



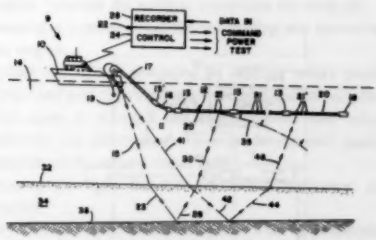
1. Dental treatment apparatus comprising at least one dental treatment instrument, such as a drill; a control data store in which certain fixed control data values, such as certain drill speed values, are stored and are retrievable when required; a display device suitable for displaying variable values; control means for the instrument being coupled with the control data store for varying of the control data starting from said fixed control data values, the control data store being settable by the control means with instantaneous values of control data as fixed values to be stored; a data converter for converting the instantaneous values of control data into corresponding instantaneous operating data values to be displayed by the display device; said control member converting the control data emitted in each instance by the control data store into corresponding analog voltages, said voltages being modified by the emission of an analog voltage corresponding to a desired modification, and which act as operating signals for the instrument; means for varying the amplitude of the analog voltages corresponding to the control data; and control means comprising a digital-analog converter, an adding circuit having an input side connected to an output of the digital-analog converter, a voltage-emitting device connected to the input side of the adding circuit, and means for adjusting the voltage emitted by the voltage-emitting device, and in which an output of the adding circuit serves as a source from which said operating signals are derived and which forms new control data; a plurality of dental treatment instruments, adjusting members associated each with a respective instrument and being suppliable with the output voltage emitted in each instance from said adding circuit as an analog operating data signal, and an analog digital converter being connected to said adding circuit and being connected to said display device to supply a digital display signal thereto.

4,479,183

METHOD OF EDITING SEISMIC TRACES, AS SAY GATHERED BY LARGE MULTICHANNEL COLLECTION SYSTEMS

Raymond A. Ergas, Laguna Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1982, Ser. No. 429,358
Int. Cl.³ G01V *1/28*, *1/36*
U.S. Cl. 364—421 18 Claims



1. A method of examining field traces T0, T1, T2 . . . T associated with a large multichannel seismic collection survey providing channels of data per each source activation, resulting in N fold subsurface common depth point coverage of an earth formation, without either full trace examination occurring along the full time scale of said trace, or without examination of adjacent traces associated with each trace T0 . . . T, comprising

(i) determining a time window for examining each trace T0 . . . T, said window defining a trace segment thereof containing a plurality of sample points defining an original waveform having a signal-to-noise ratio below unity, wherein noise spectrum characteristics of said original waveform can be identified;

(ii) generating a series of non-normalized and normalized autocorrelation functions F0, F1 . . . F associated with said

noise spectrum over said time window i for said trace T0 . . . T;

(iii) comparing said generated autocorrelation functions F0, F1 . . . F of step (ii) with a series of similar values associated with a noise spectrum of a standard trace which experience indicates if the limits thereof are exceeded, is unacceptable for further processing;

(iv) if said generated limits of step (iii) exceed said standard limits of said standard trace, removing said trace from further seismic processing, said removal occurring without the need of examining other time segments of said trace and without examining adjacent traces associated with said trace T0 . . . T.

4,479,184

DEVICE FOR MAINTAINING A CONSTANT VEHICLE SPEED

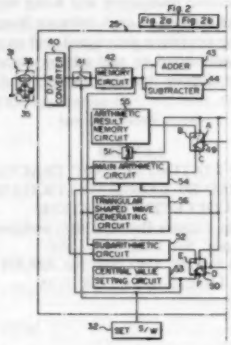
Jiro Nakano, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

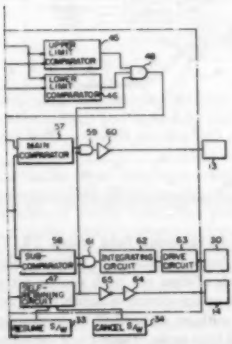
Filed Jul. 24, 1981, Ser. No. 286,717

Claims priority, application Japan, Nov. 5, 1980, 55-154573

Int. Cl.³ G05D *13/58*; F02M *23/04*

U.S. Cl. 364—424 **23 Claims**





1. A speed maintaining device of a vehicle, comprising:

a main intake passage having therein a throttle valve for controlling the amount of air fed into an engine;

a main actuator connected to said throttle valve for controlling the opening degree of said throttle valve;

an auxiliary intake passage branched off from said main intake passage upstream of said throttle valve and connected to said main intake passage downstream of said throttle valve, said auxiliary intake passage having therein an auxiliary valve for controlling the amount of air flowing within said auxiliary intake passage;

an auxiliary actuator connected to said auxiliary valve for controlling the flow area of said auxiliary valve;

vehicle speed detecting means for detecting a vehicle speed at which the vehicle is now driven;

memory means for storing said vehicle speed as a set speed to be maintained on the basis of a driver's indication;

discriminating means for comparing the vehicle speed and the set speed to produce discriminating signals representing whether the vehicle speed is within a range between a predetermined upper limit and a predetermined lower limit which are higher and lower than said set speed, respectively;

main arithmetic control means in response to said discriminating signals for actuating said main actuator to minimize a speed difference between the vehicle speed and the set speed when the vehicle speed is not within said range, and;

subarithmetic control means in response to said discriminating signals for actuating said auxiliary actuator to minimize said speed difference when the vehicle speed is within said range,

wherein said device comprises a manually operated set switch, and said memory means stores the vehicle speed when said set switch is operated, and

wherein said main actuator comprises a vacuum operated diaphragm apparatus connected to said throttle valve and having therein a vacuum chamber connected to a vacuum source, and an electromagnetic control valve controlling the level of the vacuum produced in said vacuum chamber in response to a control signal issued from said main arithmetic control means.

4,479,185

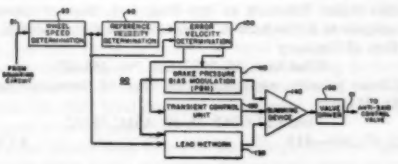
APPARATUS FOR GENERATING A LEAD SIGNAL IN AN ANTISKID SYSTEM

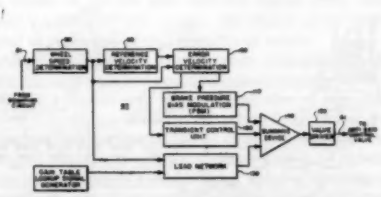
Robert D. Cook, Valencia, Calif., assignor to Crane Co., Chicago, Ill.

Continuation-in-part of Ser. No. 359,819, Mar. 19, 1982, abandoned, which is a continuation of Ser. No. 146,614, May 5, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 475,039

Int. Cl.³ B60T *8/00*; G06F *15/20*

U.S. Cl. 364—426 **21 Claims**





1. In an antiskid system including a wheel, a brake coupled to the wheel, means for generating a wheel signal indicative of a selected time derivative of the rotational position of the wheel, modulator means responsive to the wheel signal for generating a modulator output signal as a time integral function of the wheel signal, and means responsive to the modula-

tor output signal for reducing braking action of the brake, the improvement comprising:

means for generating an input signal indicative of a predetermined time derivative of the angular velocity of the wheel, said predetermined time derivative of angular velocity corresponding to a higher order time derivative of the rotational position of the wheel than the selected time derivative of the rotational position of the wheel;

means, responsive to the modulator output signal, for generating a gain factor as a function of the modulator output signal such that the gain factor is set to a first gain value when the modulator output signal is within a first range of values, and to a second gain value, higher than the first gain value, when the modulator output signal is within a second range of values indicative of a lesser reduction of braking action than the first range of values;

means for generating a lead signal as a function of the gain factor and the input signal; and

means for modifying the modulator output signal as a function of the lead signal to provide lead compensation;

said modulator having a gain independent of said gain factor.

4,479,186

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

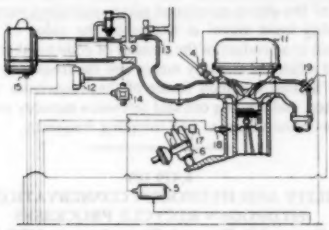
Mitsunori Takao, Kariya, and Toshiaki Mizuno, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

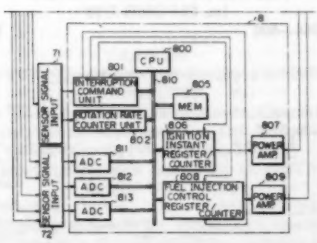
Filed Aug. 19, 1981, Ser. No. 294,154

Claims priority, application Japan, Aug. 19, 1980, 55-112947

Int. Cl.³ F02B *5/02;* **F02D** *5/02;* **G06F** *15/20*

U.S. Cl. 364—431.05 **12 Claims**





1. A method for controlling an internal combustion engine having a pressure sensor for sensing the air intake pressure of the engine and producing a signal corresponding to the sensed air intake pressure, a sensor for sensing the rotational angle of the engine and producing a signal corresponding to the sensed rotational angle, and a computer for calculating a control value using said produced signals of the sensed air intake pressure and the sensed rotational angle and producing at least one signal corresponding to said control value, said produced control value signal being used for controlling the operation of said engine; wherein the method comprises the steps of:

generating a control value for controlling the operation of the engine,

sampling the signals produced by said air intake pressure sensor and said rotational angle sensor successively during time units at selected intervals,

measuring the time between successive rotational angle signals,

calculating an engine rotational speed N for each successive rotational angle signal in accordance with the corresponding time measurement,

calculating a value ΔPm which is the difference between the signal of said air intake pressure sensor in the preceding time unit and the signal of the air intake pressure sensor in the present time unit and a value ΔN which is the difference between the calculated value N for the signal of said rotational angle sensor in the preceding time unit and the calculated value N for the signal of said rotational angle sensor in the present time unit,

calculating a correction value from said calculated values ΔPm and ΔN,

modifying the control value for controlling the operation of said engine by said calculated correction value, and

delivering said modified control value to the engine.

10. A method for controlling an internal combustion engine having a pressure sensor for sensing the air intake pressure of the engine and producing a signal corresponding to the sensed air intake pressure, a sensor for sensing the rotational angle of the engine and producing a signal corresponding to the sensed rotational angle, and a computer for calculating a control value using said produced signals of the sensed air intake pressure and the sensed rotational angle and producing at least one signal corresponding to said control value, said produced control value signal being used for controlling the operation of said engine, wherein the method comprises the steps of:

generating a control value for controlling the operation of the engine,

sampling the signals produced by said air intake pressure sensor and said rotational angle sensor successively during time units at selected intervals, wherein said selected intervals are determined by a predetermined angle of rotation of the engine crank shaft,

measuring the time between successive rotational angle signals,

calculating an engine rotational speed N for each successive rotational angle signal in accordance with the corresponding time measurement,

calculating for each time unit a value ΔPm which is the difference between the signal of said air intake pressure sensor in the preceding time unit and the signal of the air intake pressure in the present time unit and a value ΔN which is the difference between the calculated value N for the signal of said rotational angle sensor in the preceding time unit and the calculated value N for the signal of said rotational angle sensor in the present time unit,

calculating a correction value from said calculated values ΔPm and ΔN,

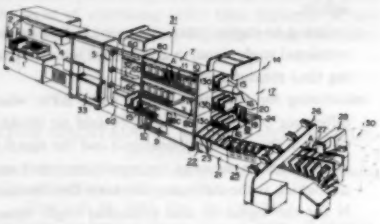
modifying the control value for controlling the operation of said engine by said calculated correction value, and

delivering said modified control value to the engine.

4,479,187
CLASSIFYING APPARATUS WITH AUTOMATIC REMOVAL DEVICE

Seietsu Nara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 7, 1981, Ser. No. 328,397
Claims priority, application Japan, Dec. 19, 1980, 55-178732
Int. Cl.³ G06F *15/24*; B65G *1/06*; B07C *5/00*
U.S. Cl. 364—478 **2 Claims**



1. A classifying apparatus with automatic removal device comprising:

(a) means for reading out classifying information provided on matter such as sheets to be classified;

(b) a plurality of stacking sections arranged in a plurality of rows extending one above another each provided with a take-out mechanism;

(c) means for distributing the matter to be classified to said plurality of stacking sections according to classifying information from said reading means;

(d) a transport section driven to successive positions corresponding to said respective stacking sections and receiving the distributedly stacked matter from said stacking section;

(e) means for detecting whether the distributedly stacked matter in said stacking section is in a removal ready state before a full state or in the full stack state;

(f) control means for providing a control signal when the empty transport section is brought to a position corresponding to said stacking section during a period from the detection of the removal ready state of the stacked matter in said stacking section before the full stack state to the detection of the full stack state, or after the detection of the full stack state, these states being detected by said detecting means; and

(g) driving means operatively connected to said control means to receive said control signal therefrom, said driving means for driving the removal mechanism of said stacking section in response to the control signal from said control means such that said stacked matter is transferred onto said empty transport section.

4,479,188
DIGITAL DETECTOR FOR A MULTI-FREQUENCY CODE IN AN ANALOG SIGNAL

Johannes de Keijzer, Zoetermeer, Netherlands, assignor to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie), The Hague, Netherlands

Continuation-in-part of Ser. No. 143,191, Apr. 24, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,241
Claims priority, application Netherlands, May 2, 1979, 7903462
Int. Cl.³ G06F *15/34*; G01S *9/23*
U.S. Cl. 364—484 **2 Claims**

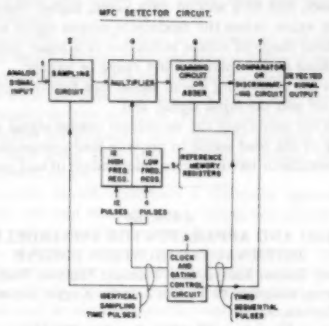
1. An apparatus for digitally detecting one or more of a plurality of fixed frequencies which are present in an incoming signal according to the correlation method, the fixed frequencies occurring in a first group of lower frequencies and in a second group of higher frequencies, said apparatus comprising:

(a) means (2) for sampling the incoming analog signal of said fixed frequencies,

(b) a reference memory means (5) having separate registers in which are stored sine reference code number pulses and a cosine reference code number pulses for a whole number of periods of each of the frequencies to be detected, the lower group of frequencies having six code number pulses per period which pulses have the values of +1, +1, 0, −1, −, 0, and in the higher group of frequencies having two pulses per period, which pulses have the values of 30 1 and −1,

(c) means (4) for the multiplication of the samples of said incoming signals with said reference code number pulses,

(d) means (6) for adding the resulting multiplication products,



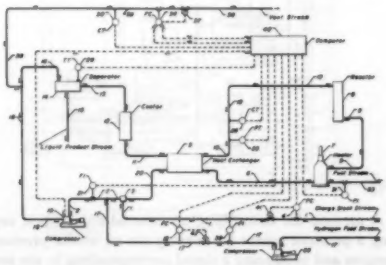
(e) means (7) for comparing and selecting the highest valued multiplied product as corresponding to the frequency to be detected, and

(f) a clock pulse and control circuit (3) means for controlling all of the above mentioned means including sampling the analog input signal at frequency the value of which is equal to a product of the number of code number pulses in said reference memory means and the frequency which is the highest common factor of the frequencies to be detected, and reading out said reference memory means said sine-cosine values at said sampling frequency.

4,479,189
UTILITY AND HYDROGEN CONSERVATION IN HYDROGEN RECYCLE PROCESSES

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 23, 1984, Ser. No. 374,859
Int. Cl.³ G06G *7/58*
U.S. Cl. 364—500 **10 Claims**



1. In a hydrocarbon processing unit controlled by computer means and means for monitoring process variables, said unit comprising heater means, reactor means, cooler means, gas-liquid separator means, and compressor means, wherein a charge stock stream comprising hydrocarbons is combined with a

recycle stream comprising hydrogen and hydrocarbon vapors to form a feed stream which is heated in said heater means and then charged to said reactor means, wherein an effluent stream from said reactor means is cooled in said cooler means so that it is separated into a liquid product stream and a hydrogen and hydrocarbon vapor stream in said gas-liquid separator means, wherein at least a portion of said hydrogen and hydrocarbon vapor stream is recycled through said compressor means to said heater means and reactor means to serve as a portion of said feed stream, wherein a vent gas stream consisting of a portion of said hydrogen and hydrocarbon vapor stream is removed from said hydrocarbon processing unit, wherein it is desirable to maintain the hydrogen concentration in said reactor means at or above a certain minimum value, a method of using the lesser quantities of utilities and hydrogen, which method comprises the following steps:

(a) providing the concentration of hydrogen in said hydrocarbon processing unit to said computer means;

(b) comparing, in said computer means, said concentration of hydrogen to a previously established value;

(c) providing monitored process variables from said processing unit to said computer means;

(d) calculating in said computer means the values of compressor output and vent gas flow which satisfy the conditions that said hydrogen concentration is equal to said previously established value and that said unit is operating at a minimum cost, said cost being based on:

(i) fuel supplied to said heater means,

(ii) power supplied to said compressor means,

(iii) the quantity of hydrogen supplied to said processing unit minus a credit for hydrogen removed from said processing unit in said vent gas stream;

(e) adjusting compressor output and vent gas flow to the calculated values; and,

(f) continuously repeating steps (a) through (e) as process measurements used in said calculation vary.

4,479,190

DETECTING APPARATUS USING A DIGITAL COMPUTER

Hiromitsu Takai, Kariya, and Akira Shibata, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 10, 1981, Ser. No. 329,576

Claims priority, application Japan, Dec. 12, 1980, 55-176403

Int. Cl.³ G05B 1/06

U.S. Cl. 364—556 **13 Claims**

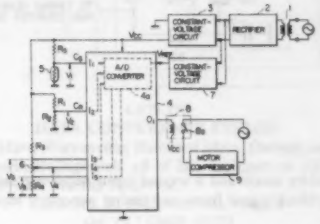
1. A detecting apparatus for generating a control output signal indicative of a physical parameter, including means for compensating for a change of supply voltage to a sensor of said physical parameter comprising:

an electric power source supplying a source voltage;

input means, connected to said electric power source and responsive to said physical parameter to be detected, for producing a first voltage signal varying in accordance with the detected physical parameter and in proportion to the source voltage supplied from said electric power source;

reference means, connected to said electric power source, for generating a second voltage signal varying in direct proportion to the source voltage but independent from changes in the detected physical factor;

control means, connected to said input means and said reference means, including analog-digital converter means for converting said first voltage signal into a first digital signal and converting said second voltage signal into a second digital signal, fixed means for providing a fixed digital signal predetermined to be equal to said second digital signal when the source voltage supplied from said electric



power source is a predetermined value and compensating means for compensating said first digital signal in a direction to increase said first digital signal by an amount equal to said fixed digital signal and in a direction to decrease said first digital signal by an amount equal to said second digital signal, said control means producing a control output signal equal to the first digital signal, as compensated by said compensation means; and

an output device responsive to said control output signal from said control means.

4,479,191

INTEGRATED CIRCUIT WITH INTERRUPTABLE OSCILLATOR CIRCUIT

Minejiro Nojima, Kamakura; Makiji Kobayashi, Yokohama, and Atsushi Kobayashi, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1981, Ser. No. 283,015

Claims priority, application Japan, Jul. 22, 1980, 55-100370; Jul. 22, 1980, 55-100371

Int. Cl.³ G06F 1/04

U.S. Cl. 364—707 **14 Claims**

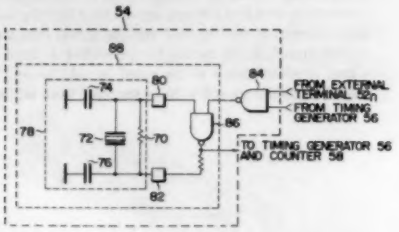
1. A semiconductor integrated circuit capable of being selectively set to an operation mode and a stand-by mode comprising:

(a) oscillator means for generating an oscillation signal when an enable signal indicates that said semiconductor integrated circuit is in said operation mode and for not generating an oscillation signal when said enable signal indicates that said semiconductor integrated circuit is in said stand-by mode;

(b) timing generator means coupled to said oscillator means for generating, in response to said oscillation signal, timing signals for said semiconductor integrated circuit and for generating an oscillation block signal in response to a first signal supplied from said semiconductor integrated circuit; and

(c) gate means coupled to said oscillator means for output-

ting said enable signal, said gate means having one input receiving a second signal indicating the onset of said



stand-by mode and a second input receiving said oscillation block signal from said timing generator means.

4,479,192

STRAIGHT LINE COORDINATES GENERATOR

Nobuhiko Yamagami, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,579

Claims priority, application Japan, Jan. 21, 1981, 56-7544; Jan. 21, 1981, 56-7546

Int. Cl.³ **G06F** *3/153*

U.S. Cl. 364—719 **7 Claims**

1. A new and improved straight line coordinate generator to determine and generate the coordinates of a group of lattice points $[P_k(k=1, 2, \ldots, n-1)]$ to simulate an actual line defined by connecting the two lattice points $P_0(x_0, y_0)$ and $P_n(x_n, y_n)$, on a secondary coordinates face, comprising:

first adder means for generating a first normalized y-coordinate result;

first register means, electrically connected to said first adder means, for supplying said first adder means with a first decimal eliminating value;

second register means, electrically connected to said first adder means, for supplying said first adder means with a first y-coordinate distance value and for storing the results of said first adder means;

second adder means for generating a second normalized y-corrdinate result;

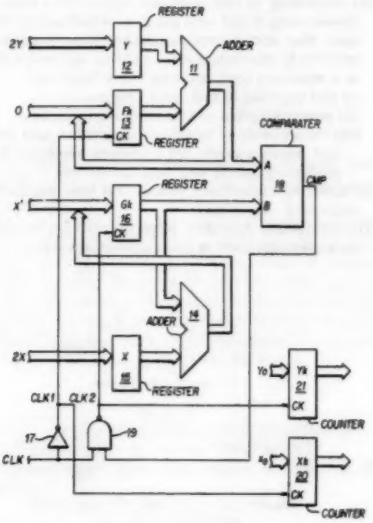
third register means, electrically connected to said second adder means, for supplying said second adder means with a second decimal eliminating value;

fourth register means, electrically connected to said second adder means, for supplying said second adder means with a second y-coordinate distance value and for storing the results of said second adder means;

comparator means, electrically connected to said first adder means and said fourth register means, for comparing the stored contents of said fourth register means with the results of said first adder means;

clock means for generating a basic clock signal;

gate circuit means, electrically connected to said comparator means, said clock means, said second register means and said fourth register means, for generating a first clock



signal from said basic clock signal and a second clock signal in response to a logic signal from said comparator means, said second register means synchronized by said first clock signal and fourth register means synchronized by said second clock signal;

x-coordinate counter means, electrically connected to said gate circuit means, for determining x-coordinate values in synchronization with said first clock signal;

y-coordinate counter means, electrically connected to said gate circuit means, for determining y-coordinate values in synchronization with said second clock signal;

initializing means, electrically connected to each register means, for setting said first register means, said second register means, said third register means and said fourth register means with initial values whereby the use of decimal points is eliminated;

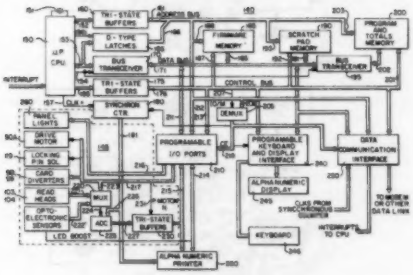
a generating means, electrically connected to said x-coordinate counter means and said y-coordinate counter means for sequentially generating each x and y coordinate of said group of lattice points to simulate said line, in response to said x-coordinate counter means and said y-coordinate counter means.

4,479,193
Patent Not Issued For This Number

4,479,194
SYSTEM AND METHOD FOR READING MARKS ON A DOCUMENT

M. Charles Fogg, Hermosa Beach; Charles F. Krieger, Villa Park, and John R. Veale, Manhattan Beach, all of Calif., assignors to Computer Election Systems, Berkeley, Calif.

Filed Aug. 10, 1982, Ser. No. 406,920
Int. Cl.³ G06F *7/12;* **G06K** *3/00;* **G07C** *13/00*
U.S. Cl. 364—900 **58 Claims**



1. In a system for reading marks on a document having at least one mark track comprising a plurality of prearranged candidate mark regions with blank regions therebetween,

reading means including illuminating means for directing a beam of light to a prearranged illumination region and sensing means for receiving one of reflected or transmitted values of illumination from said illumination region and producing an analog output signal representing said values of illumination;

means producing relative scanning motion between said reading means and said mark track;

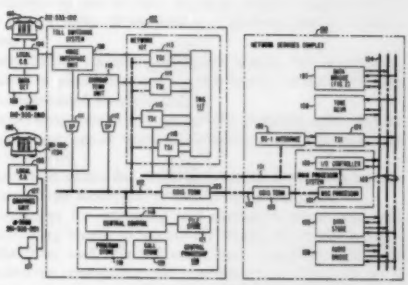
signal conversion means for sampling said analog output signal and converting sampled signals to corresponding binary digital words; and

digital computer means coupled to said signal conversion means, including means for: acquiring at least one background digital word representing a background illumination value as said illumination region traverses each said blank region of said mark track and a plurality of candidate digital words representing a plurality of sequential illumination levels from subregions of each candidate mark region, calculating a separate digital mark detect threshold word value for each of said candidate mark regions as a prearranged function of at least one background digital word associated with an adjacent blank region, and registering a mark in a candidate mark region when the value of one of said candidate digital words is less than or equal to said associated digital mark detect threshold word value.

4,479,195
DATA CONFERENCE SYSTEM

Diane E. Herr, Warrenville; Reinhard Metz, Oswego, and Larry A. Russell, Bolingbrook, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 7, 1982, Ser. No. 415,254
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—900 **9 Claims**



1. For use in a communications network having data terminals, communication channels and a switching system for interconnecting said terminals over said channels for the exchange of data, a conference arrangement comprising

processor means coupled to said switching system;

a plurality of ports connectable to said communication channels;

means coupling said ports to said processor means; and

a buffer memory connectable to said processor means, said ports and said coupling means;

said processor means comprising means responsive to a conference request signal from said switching system for designating a plurality of ports for conferencing by individually coupling one of said communication channels serving a said data terminal to one of said ports;

each said port comprising means responsive to a data signal from said terminals for storing said data signals at a preassigned location in said buffer memory and for transmitting a data received signal to said processor means indicating that said data signal has been stored; and

said processor means responsive to said data received signal from one of said designated ports for ordering the other of said designated ports to transmit over their communica-

tion channels to their respective data terminals the contents of said preassigned memory location.

4,479,196

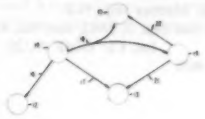
HYPEREDGE ENTITY-RELATIONSHIP DATA BASE SYSTEMS

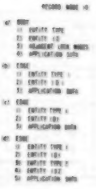
Richard S. Ferrer, Belle Mead; Alan J. Goldstein, Livingston, and Zaher A. Nazif, High Bridge, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 15, 1982, Ser. No. 441,730

Int. Cl.[3] **G06F** *15/40*

U.S. Cl. 364—900 **10 Claims**





1. A data base system comprising

a data base comprising a plurality of records each including a body portion and a plurality of edge portions for storing signals,

at least one of said edge portions including pointer signals to a plurality of other records, and

means for accessing and utilizing the signals stored in said records.

4,479,197

METHOD AND APPARATUS FOR SELECTING AND SETTING THE MODE OF OPERATION FOR A MECHANISM

George A. Haag, Colorado Springs; O. Douglas Fogg, Loveland; Gordon A. Greenley; Steve A. Shepard, both of Colorado Springs, all of Colo., and F. Duncan Terry, Meridan, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 210,462, Nov. 25, 1980, Pat. No. 4,373,193, which is a continuation of Ser. No. 75,787, Sep. 17, 1979, abandoned, which is a division of Ser. No. 828,138, Aug. 29, 1977, abandoned. This application Dec. 29, 1982, Ser. No. 454,387

Int. Cl.[3] **G06F** *3/153*

U.S. Cl. 364—900 **18 Claims**

1. In a mechanism having a plurality of operator selectable modes of operation, mode selection apparatus comprising:

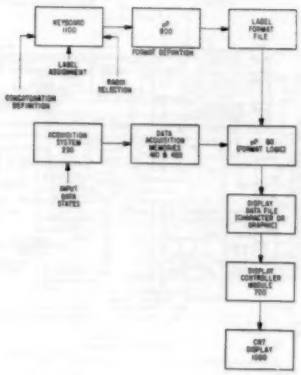
display means for displaying upon a viewable surface a legend within a mode specification portion of the viewable surface and also for displaying a cursor positionable to the mode specification portion of the viewable surface;

cursor positioning means, responsive to an operator's indication of a desired location of the cursor, for producing a cursor position signal indicative of the desired cursor position;

mode selection means, responsive to the operator's indication that a different mode of operation is to be a selected mode of operation, for producing a mode selection signal indicative that a different mode of operation is to be the selected mode of operation; and

processing means coupled to each of the means recited above and comprising:

cursor production means, responsive to the cursor position signal, for producing upon the display means a



cursor positionable to the mode specification portion of the viewable surface;

legend production means, responsive to the mode selection signal and the position of the cursor, for causing the legend displayed in the mode specification portion of the viewable surface to be one of a plurality of separate legends each associated with a different selectable mode of operation and also for responding to actuation of the mode selection means during times when the cursor is positioned to the mode specification portion of the viewable surface by replacing the displayed legend with a different legend from the plurality of separate legends; and

means, responsive to the legend displayed in the mode specification portion of the viewable surface, for altering internal conditions within the mechanism to correspond to the mode of operation associated with the

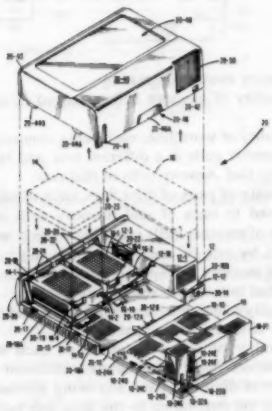
different legend displayed in the mode specification portion of the viewable surface.

4,479,198

MODULAR COMPUTER SYSTEM

Domenic R. Romano, Chelmsford; Hans H. Henneberg, Canton; James W. Pratt, Kingston, and Maurice A. Coppelman, Framingham, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 23, 1983, Ser. No. 468,916
Int. Cl.³ H05K *5/00*
U.S. Cl. 364—900 **49 Claims**



1. A computer system comprising:

a plurality of electronically operated modules corresponding to the basic subsystems of said system which are capable of being assembled by a non-technical user within an enclosure assembly to form said system, each of said modules including the components of one of said subsystems and a wrapper shaped for completely enclosing a physical configuration of subsystem components of said one subsystem to permit damage-free handling of each of said modules by said user, and

said enclosure assembly including:

a horizontal base and a bezel joined together to form the front, bottom and sides of said enclosure, said base including a top portion having a plurality of open compartments into which said user can loosely place similarly shaped ones of said modules during system assembly and said bezel having a plurality of openings for framing and restraining certain ones of said modules placeable into different ones of said base compartments by said user; and

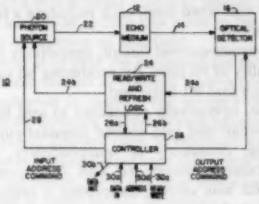
a top cover having top, back and side portions shaped to fit over said base and bezel to completely enclose said modules, said cover being embossed inside to provide a plurality of protrusions, said protrusions being located and shaped so as to properly position each of said modules within said enclosure during the closing of said cover and for holding said modules in place when said cover is latched to said base.

4,479,199

INFORMATION STORAGE SYSTEM USING A PHOTON ECHO MEDIUM

Marc A. Friedlander, 20217 Darlington Dr., Gaithersburg, Md. 20760, and Sheldon Z. Meth, 11104 Oak Leaf Dr., Silver Spring, Md. 20901

Filed Mar. 23, 1981, Ser. No. 246,175
Int. Cl.³ G11C *13/04*
U.S. Cl. 365—119 **52 Claims**



1. An information storage system, comprising:

A. echo medium including a plurality of cells, each of said cells including one or more molecules having at least one excited state and a ground state, said excited state being excitable by one or more incident photons characterized by one or more of a plurality of predetermined frequencies,

B. selectively operable excitation means for generating pulses of photons characterized by one or more of said predetermined frequencies,

C. addressing means for selectively directing said photon pulses onto one or more of the molecules of selected ones of said cells,

D. detection means for detecting photons emitted by one or more of the molecules of said selected cells, and

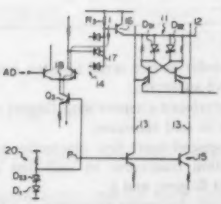
E. controller for operating said excitation means and said addressing means to selectively store data in and extract data from said selected cells, said controller including means for controlling said excitation means to generate a predetermined succession of said photon pulses for a cell selected by said addressing means whereby at least one molecule may first be excited and subsequently generate an echo comprising at least one emitted photon.

4,479,200

SEMICONDUCTOR MEMORY DEVICE

Masashi Sato, Kawasaki, and Yasuhisa Sugo, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 453,110
Claims priority, application Japan, Dec. 29, 1981, 56-213411
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—175 **4 Claims**



1. A semiconductor memory device comprising:

a plurality of word lines;

a plurality of bit lines intersecting said plurality of word lines;

static type memory cells, respectively, operatively connected at the intersections of said plurality of word lines and bit lines, having parallel circuits as loads, each of said loads comprising:

a first Schottky diode having a forward voltage; and

a resistor operatively connected in parallel with said first Schottky barrier diode;

word decoder driver circuits, respectively, operatively connected to said word lines, each including a first constant-current circuit;

a second constant-current circuit, operatively connected to said plurality of bit lines, for producing bit currents flowing through said bit lines; and

a bias circuit, operatively connected to said first constant-current circuit and said second constant-current circuit, for biasing, commonly or independently, said second constant-current circuit and said first constant-current circuit, said bias circuit comprising a second Schottky barrier diode for compensating a variation in the forward voltage defined by said first Schottky barrier diode, said second Schottky barrier diode having substantially the same forward voltage as that of said first Schottky barrier diode.

4,479,201

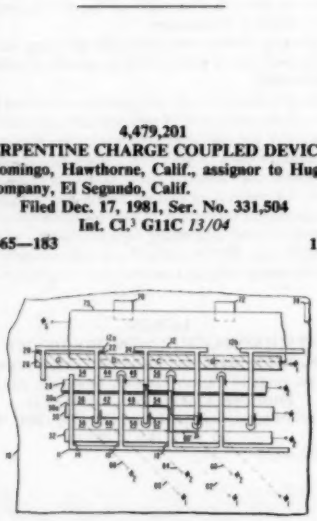
SERPENTINE CHARGE COUPLED DEVICE

George Domingo, Hawthorne, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 17, 1981, Ser. No. 331,504

Int. Cl.³ G11C *13/04*

U.S. Cl. 365—183 **12 Claims**



1. A charge transfer device serial register, comprising:

a semiconductive substrate;

a plurality of interlaced channel stop fingers extending in a first direction in said substrate;

a pluraliity of spaced-apart first electrodes extending in a second direction transverse to said first direction and overlying said fingers; and a

plurality of second electrodes extending in a third direction transverse to both said first and second directions and overlying the gaps between adjacent ones of said first electrodes, wherein said first electrodes are formed in a first insulated layer over said substrate and said second electrodes are formed in a second insulated layer.

4,479,202

CMOS SENSE AMPLIFIER

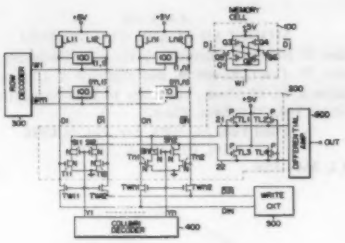
Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 186,768, Sep. 12, 1980, abandoned. This application May 11, 1983, Ser. No. 493,604

Claims priority, application Japan, Sep. 13, 1979, 54-116771

Int. Cl.³ G11C *7/06*; H03K *5/24*

U.S. Cl. 365—190 **5 Claims**



1. A memory circuit comprising:

(a) a plurality of memory cells arranged in rows and columns;

(b) a plurality of word lines each being connected to ones of said memory cells in a different row and being used for selecting said memory cells in that row;

(c) a plurality of pairs of digit lines, each of said pairs being connected to ones of said memory cells in a different column of memory cells such that when a memory cell is selected by one of said word lines, the output of said selected memory cell appears across the pair of digit lines connected to said selected memory cell;

(d) a plurality of column lines each corresponding to a different one of said digit line pairs;

(e) a plurality of sense preamplifiers, each of said sense preamplifiers being coupled to a different one of said plurality of digit line pairs and being activated by a column line corresponding to the digit line pair coupled to the preamplifier, each of said sense preamplifiers including

first and second MOS input transistors of a first channel type each having a gate, drain and source, said sources of said input transistors being connected together and said gates of said input transistors being connected to a different one of the digit lines in the digit line pair coupled to the preamplifier, and

first and second MOS switching transistors of said first channel type, each of said switching transistors having a gate, drain and source, said sources of said switching transistors being connected respectively to said drains of said first and second input MOS transistors and said gates of said switching MOS transistors being connected to the column line corresponding to said coupled digit line pair;

(f) a load circuit connected to each of said plurality of sense preamplifiers, said load circuit including

first and second load MOS transistors of a second channel type each having a gate, drain and source, and drains of said first and second load MOS transistors being connected to said drains of said first switching MOS transistors in each of said sense preamplifiers and said gates of said first and second load MOS transistors being connected respectively to said drains of said first and second switching MOS transistors in each of said sense preamplifiers, and

third and fourth load MOS transistors of said second channel type each having a gate, drain and source, said drains of said third and fourth load MOS transistors being connected to said drains of said second switching MOS transistors in each of said sense preamplifiers and

said gates of said third and fourth load MOS transistors being connected respectively to said drains of said first and second switching MOS transistors in each of said sense preamplifiers; and

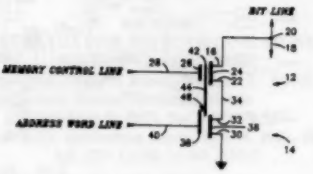
(g) a differential amplifier having one input connected to said gates of said first and third load MOS transistors in said load circuit and another input connected to said gates of said second and fourth transistors, the output of said differential amplifier indicating the contents of a memory cell selected by a work line and coupled, through a digit line pair, to a sense preamplifier selected by a column line.

4,479,203

ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY CELL

Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 16, 1981, Ser. No. 321,855
Int. Cl.³ G11C 7/00, 11/40
U.S. Cl. 365—218 **7 Claims**



1. An electrically erasable programmable read only memory cell comprising:

a floating gate transistor having source and drain regions formed in a face of a body of a semiconductor material with a channel region therebetween, a floating gate on said face having a first portion which overlies said channel region and is insulated therefrom, and a control gate overlying said first portion of the floating gate and insulated therefrom; and

a control transistor having source and drain regions formed in said face with a channel region therebetween, and a control gate which overlies said channel region of said control transistor and is insulated therefrom;

wherein the drain region of said control transistor is coupled to the source region of said floating gate transistor; and

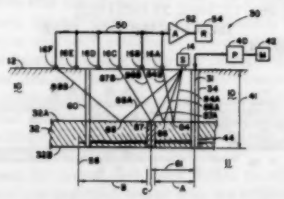
wherein the control gate of said control transistor extends over at least a second portion of said floating gate and is insulated therefrom to form an erase window.

4,479,204

METHOD OF MONITORING THE SPACIAL PRODUCTION OF HYDROCARBONS FROM A PETROLEUM RESERVOIR

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Continuation-in-part of Ser. No. 41,061, May 21, 1979, Pat. No. 4,282,587. This application Jun. 1, 1981, Ser. No. 268,787
Int. Cl.³ G01V 1/135
U.S. Cl. 367—47 **28 Claims**



1. In a mineral recovery program such as for recovering petroleum hydrocarbons from a selected geological formation in the earth; in which at least two spaced boreholes are drilled from the surface into said formation; a first one of said boreholes used for producing the first fluid in said formation, and the second of said boreholes used for injecting a selected second fluid into said formation for the purpose of flooding said formation, and driving said first fluid to, and producing said first fluid from, said first borehole;

the method of monitoring the movement of the boundaries of the zone from which said first fluid has been produced, comprising the steps of:

(a) providing a first selected source of seismic waves at or near the surface at at least one point in the vicinity of the point of injection of said fluid;

(b) positioning at or near the surface of the earth a plurality of seismic sensors at selected known positions, said sensors adapted to receive the upward reflection of downwardly directed seismic waves generated by said source, and to convert them to electrical signals;

(c) selecting said second fluid such that when it is injected into said formation, there will be at least a partial saturation of gas in liquid in said formation;

(c) injecting said second fluid into said formation through said second borehole, while producing said first fluid from said first borehole;

(e) operating said seismic source a first time and recording the first electrical signal from at least two of said sensors; and

(f) comparing the first electrical signals from each of said at least two sensors.

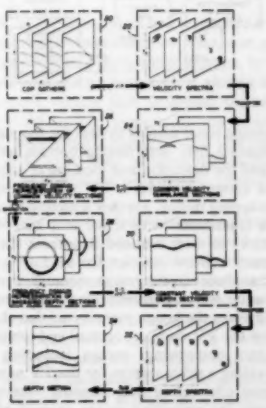
24. The method as in claim 1 in which said selected source provides frequencies at least up to 100 Hz.

4,479,205

METHOD OF MIGRATING SEISMIC DATA WITHOUT DEPENDENCY ON VELOCITY

William C. Gray, Houston, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,962
Int. Cl.³ G01V 1/32
U.S. Cl. 367—63 **5 Claims**



1. A method for migrating seismic data comprising the steps of:

generating acoustic waves into an earth formation from a plurality of spaced sources;

receiving reflections or refractions of said acoustic waves at a plurality of spaced receivers, thus forming seismic data;

gathering said seismic data in common depth point gathers;

producing a velocity spectra for said common depth point gathers;

using said velocity spectra to generate velocity semblance sections formed as a three dimensional matrix having axes of common depth point (x), zero offset time (t_o), and stacking velocity (V_z);

obtaining a frequency domain representation of said velocity semblance sections;

migrating said frequency domain representation of said velocity semblance sections to produce a representation of a migrated depth section;

inverse transforming said representation of a migrated depth section to yield a constant velocity depth section having axes of stacking velocity (V_z), common depth points (x), and depth (z);

producing from said constant velocity depth section a two dimensional representation of subsurface formation characteristics as a function of depth (z) and common depth point (x).

4,479,206

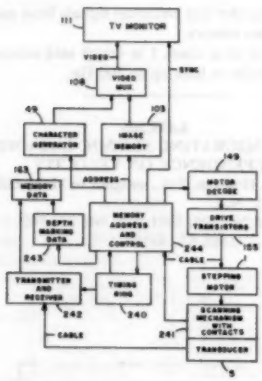
SCANNING SONAR DISPLAY SYSTEM

Mauritz L. Granberg, 6325 Thomas Ave. S., Minneapolis, Minn. 55423, and David G. Hanson, 717 Holland La. NE., Spring Lake Pk., Minn. 55432

Filed Jul. 30, 1981, Ser. No. 288,337

Int. Cl.³ G01S *15/96, 7/62*

U.S. Cl. 367—104 **18 Claims**



1. A scanning sonar display system for the purpose of detecting and locating fish, determining bottom terrian, a navigational aid and the detection and location of submerged objects which said system includes a TV monitor to display sonar images, a stepping motor, a sector scanning mechanism having contacts, a transducer with drive and receive circuitry, an image memory to store scanned data from the transducer, an entry memory address counter for loading sonar data taken from the transducer in the image memory, a refresh memory address counter which derives timing pulses for the TV monitor and addresses the image memory so that the image can be refreshed on the TV monitor, control and timing circuitry, the improvements comprising: means including said stepping motor providing a drive system for the TV monitor and transducer; means connecting said stepping motor to said transducer; means for providing sector control of said scanning mechanism; means for moving the transducer to provide sonar data mapped from a truncated cone to x-y presentation on said TV monitor; means for refreshing and loading the image memory by use of said refresh memory address counter and said entry memory address counter; means for continuous adjustment of a top delay, of range, of repetition frequency and of sonic burst width while still providing for maximum scan rate; means for presenting depth and directional data on said TV monitor; and means for converting slant distance to vertical distance and selecting the desired unit of measure.

4,479,207

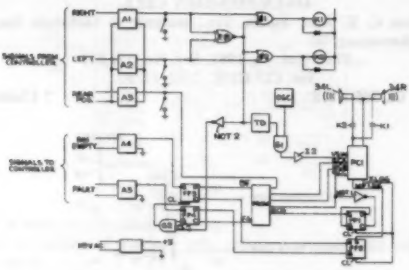
LOAD DETECTING SYSTEM FOR AUTOMATIC STORAGE APPARATUS

Hartman Peter W., Pittsford, and Patsy R. Brown, Rochester, both of N.Y., assignors to Hartman Material Handling Systems, Inc., Victor, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,794

Int. Cl.³ G01S *15/10, 15/88*

U.S. Cl. 367—107 **18 Claims**



1. An apparatus for signalling bin-full, bin-empty and "no echo" conditions in scanning a storage rack bin that has an open end, the apparatus comprising:

ranging means positioned adjacent said open end for transmitting an ultrasonic signal into said bin and for detecting an echo of said ultrasonic signal, said ranging means including means for generating timing signals for successive elapsed times from the transmission of said ultrasonic signal;

means coupled to said ranging means for generating a bin-full signal in response to said timing signals for one of said elapsed times within a first time range corresponding to a first distance range;

means coupled to said ranging means for generating a bin-empty signal in response to said timing signals for another one of said elapsed times within a second time range corresponding to a second distance range; and

means coupled to said ranging means for generating a "no echo" signal in response to said timing signals for another one of said elapsed times beyond said first and second time ranges.

4,479,208

SIGNAL PICKUP DEVICE FOR CAPACITANCE DISK RECORDS

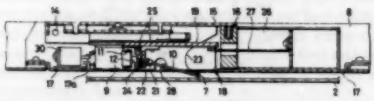
Hideaki Miyatake, Machida, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Sep. 16, 1981, Ser. No. 302,724

Claims priority, application Japan, Sep. 17, 1980, 55-132846[U]; Sep. 17, 1980, 55-132847[U]

Int. Cl.³ G11B *9/06, 17/00*

U.S. Cl. 369—43 **4 Claims**



1. A signal pickup device mounted on an arm structure movable with respect to a variable capacitance disk record

having radially spaced apart tracks, comprising within a housing:

a stylus control actuator having a coil assembly means oriented parallel to the surface of the record and movable in tangential and transverse directions with respect to said tracks in a plane parallel to the surface of said record in response to a control signal applied thereto, said coil assembly means including a pair of pivot bearings which move with said coil assembly means in said tangential and transverse directions with respect to said tracks in a plane parallel to the record surface to counteract the movements of a stylus in said tangential and transverse directions relative to said tracks;

a cantilever having said stylus secured at one end thereof and a pair of pivots at the other end thereof; and

means for magnetically detachably coupling said pivots with said pivot bearings so that the cantilever is tilted downwards to the surface of said record to allow said stylus to make contact therewith.

4,479,209

APPARATUS FOR REPRODUCING SIGNALS RECORDED ON A DISK

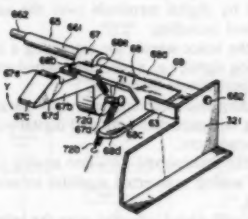
Akira Fukumitsu, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 7, 1982, Ser. No. 376,137

Claims priority, application Japan, May 9, 1981, 56-69829

Int. Cl.³ G11B *19/00, 23/02*

U.S. Cl. 369—77.2 **7 Claims**



1. An apparatus for holding a disk which is kept in a casing at all times except when being played, the disk being surrounded by a retaining frame which serves to move the disk into and out of the casing when the disk is inserted into and drawn from the apparatus, said casing providing lock means for locking the retaining frame thereto, said lock means including a stop notch formed on each inner side face of the casing, and a strip formed on each outer side face of the retaining frame and having a claw in a position to engage each said stop notch corresponding thereto, said claw being capable of being disengaged from its corresponding stop notch, said apparatus comprising:

a housing;

latch means, rotatably disposed in said housing about an axis, for locking said retaining frame to said housing when said casing with said disk is inserted into said housing;

cancel means, rotatably disposed in the housing about the same axis as said latch member, for unlocking said retaining frame from said casing when said casing with said disk is inserted into said housing, said cancel means having a portion connected thereto for rotating said latch means to unlock said retaining frame from said housing when said casing without said retaining frame and said disk is inserted into said housing; and

urging means for urging said latch means to rock from a position where said latch means does not hold said retaining frame when said casing without said retaining frame and said disk is inserted into said housing, to a position where said latch member engages said retaining frame when said casing with said retaining frame and said disk is inserted.

4,479,210

RECORD-DISC PLAYER

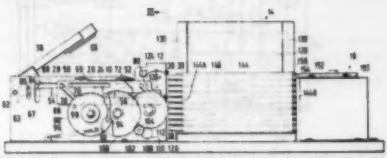
Mituhisa Nakayama, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,223

Claims priority, application Japan, Nov. 19, 1982, 57-202161; Dec. 24, 1982, 57-195237

Int. Cl.³ G11B *17/04, 17/26*

U.S. Cl. 369—194 **4 Claims**



1. A record-disc player with a loading device for loading a record disc on the turntable of the player, the loading device comprising:

a movable loading support for supporting the disc,

a guide plate fixed in a vertical plane and formed with L-shaped guide slots each comprising a horizontal section and a vertical section extending downwardly from the horizontal section at an end thereof,

a drive plate supported for movement in a horizontal direction in a plane parallel to the plane of the guide plate and formed with slots which are inclined to the direction of movement of the drive plate, the loading support comprising pins, each of which engages in an associated one of said guide slots and an associated one of said inclined slots, and

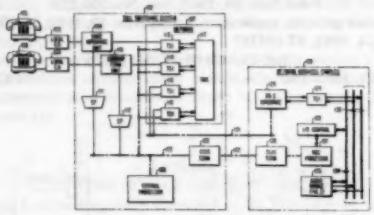
a toothed rack on the drive plate and a pinion for cooperation with the rack to move the drive plate, said guide slots being arranged to guide the loading support, by cooperation with said pins, from a rest position along a horizontal path and down a vertical path to deposit the record disc supported on the loading support on the turntable, and said inclined slots being cooperable with said pins, during movement of the drive plate, to move the loading support along and down said paths respectively, characterized in that

the player comprises a pivotal arm carrying a pressure member for urging the loaded disc into the centred position on the turntable, the arm being pivotable between an inoperative position and an operative position about a horizontal axis perpendicular to the directions of movement of the loading support, and the arm comprising a part formed with a recess which, when the arm is in the inoperative position, is located beside and coincides with the horizontal section of one of the guide slots in the guideplate at the end of said section which adjoins the vertical section of the slot, with the mouth of the recess facing towards the other end of the horizontal section, so that when the pin on the loading support which engages in that guide slot reaches the end of the horizontal section of the slot which adjoins the vertical section during the loading movement of the loading support, the pin enters said recess, and as the pin moves down the vertical section of the slot it cooperates with the recess to move the arm to the operative position.

4,479,211
METHOD AND APPARATUS FOR CONTROLLING PORTS IN A DIGITAL CONFERENCE ARRANGEMENT

Ann H. Bass, Lisle; Jeffery G. Blaschak, Downers Grove; Mohamed A. Marouf; Paul W. Vancil, both of Lisle, and David F. Winchell, Glen Ellyn, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 29, 1982, Ser. No. 437,693
Int. Cl.³ H04M 3/56
U.S. Cl. 370—62 11 Claims



1. In a multiport digital conference arrangement adapted to include in an output sample information samples from selected ports and wherein each port is adapted to assume a state in each one of a first and a second plurality of states, a method for selecting ports; comprising the steps of:

detecting the state of each port in said first plurality of states;

generating a control signal in response to particular information samples;

assigning a port a state in said second plurality of states in response to said control signal;

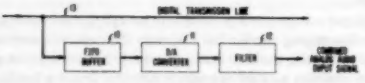
assigning a priority level to each port based on the detected and assigned states of the port; and

including in an output sample the information samples of only the ports having predetermined priority levels.

4,479,212
CONFERENCE CIRCUIT

Andres Albanese, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 12, 1982, Ser. No. 357,773
Int. Cl.³ H04J 3/02
U.S. Cl. 370—62 3 Claims



1. A conference call circuit for use in a time-division multiplex digital system in which digital data is transmitted as a data bit stream comprising a sequence of frames, each of which includes W words of B bits each; the system comprising, in cascade,

a first-in, first-out buffer stage;

a digital-to-analog converter;

and a filter;

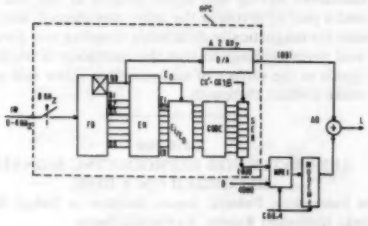
and transmission means coupling said system to the input of said buffer stage

and wherein said buffer stage extracts selected words from said data bit stream at a first bit rate, stores said selected words, and then reads them out at a second bit rate that is lower than said first bit rate.

4,479,213
TRANSMISSION METHOD FOR TRANSMITTING VOICE AND DATA INFORMATION OVER TELEPHONE LINE AND DEVICE FOR IMPLEMENTING SAID METHOD

Claude Galand, Cagnes, and Henri Nussbaumer, LaGaude, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,935
Claims priority, application European Pat. Off., Jul. 28, 1981, 81430024.0
Int. Cl.³ H04J 3/00
U.S. Cl. 370—118 13 Claims



1. A transmission method for simultaneously transmitting voice signals covering a given frequency bandwidth and pure data provided by digital terminals over the same telephone line, said method including:

processing the voice signals for extracting a low frequency band analog signal, i.e., a base band signal and characteristic voice parameters therefrom;

digitally coding said characteristic voice parameters;

multiplexing said pure data with said digitally coded characteristic parameters;

converting the multiplexed data into analog signal(s);

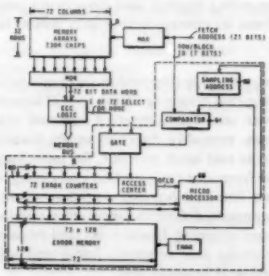
adding said analog converted signal(s) to said analog base band; and

transmitting said added signal(s) over the telephone line(s).

4,479,214
SYSTEM FOR UPDATING ERROR MAP OF FAULT TOLERANT MEMORY

Philip M. Ryan, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,832
Int. Cl.³ G06F 11/10
U.S. Cl. 371—11 8 Claims



1. A memory system having a number of memory chips arranged in a matrix of N rows and M columns for storing X data words per roll having M bit positions, X being greater than N, said system comprising:

addressing means for reading said data words from said matrix,

an error checking system for identifying and locating error in any bit of each said data word read from said matrix,

control means for establishing a range Y of memory addresses, Y being a fraction of X but greater than N,

counter means associated with respective bits of each said data word read from said matrix,

logic means connected to said control means, said error checking system, said addressing means and said counter means and operative to increment one of said counter means each time that error is identified in a respective bit of a data word having an address within said range,

an additional counter connected to said logic means,

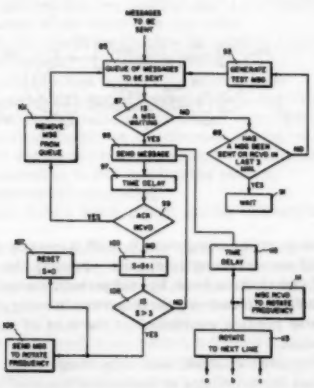
said additional counter being incremented each time a data word is read from said matrix within said range Y of memory addresses irrespective of whether error is identified in any bit thereof, and

means connected to said counter means and said additional counter to determine the ratio of the counts in each said counter means relative to the count in said additional counter.

4,479,215
POWER-LINE CARRIER COMMUNICATIONS SYSTEM WITH INTERFERENCE AVOIDANCE CAPABILITY

Lewin T. Baker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,777
Int. Cl.³ H04B 7/12
U.S. Cl. 371—33 **16 Claims**



1. A system for communicating data over a medium, comprising:

a plurality of data stations each having means coupled to said medium for receiving a carrier therefrom to recover that one of a data word and acknowledgement message modulated upon said carrier; and means for transmitting via said medium a carrier modulated with a selected one of a data word and an acknowledgment message responsive to receipt of a data word in said receiving means; each of said transmitting and receiving means simultaneously programmable to the same one of a plurality K of communications carrier frequencies;

means cooperating with each transmitting and receiving means for causing a data packet to be transmitted a predetermined number S of times; said causing means being disabled if an acknowledgment message is received after any one of the data packet transmissions;

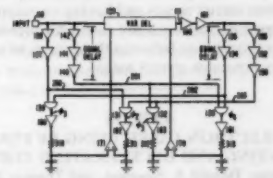
means in each station and responsive to said causing means for changing the communications carrier frequency to the next one of said plurality K of communications carrier frequencies if all predetermined number S of transmissions on a previous one of said plurality K of frequencies are not acknowledged; and

means for resetting said causing means to cause the transmitting means to transmit said data packet for an additional predetermined number of times on the next selected carrier frequency.

4,479,216
SKEW-FREE CLOCK CIRCUIT FOR INTEGRATED CIRCUIT CHIP

Robert H. Krambeck, and Masakazu Shoji, both of Warren, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 22, 1982, Ser. No. 452,157
Int. Cl.³ H03K 5/06
U.S. Cl. 371—61 **8 Claims**

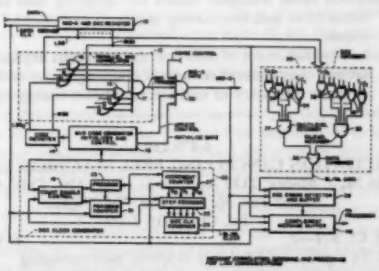


1. A circuit having an input and an output for generating at said output a clock-out signal having transitions which occur at first time separations and having high and low voltage values, means responsive to said clock-out signal for providing the average voltage of said clock-out signal, said clock-out signal occurring in response to a clock-in signal applied to said input having transitions which occur at second time separations, said circuit comprising delay means connected between said input and said output, said delay means including a variable delay stage having a control input for receiving a control signal for varying the delay in said stage in a manner to change said average voltage, said means for providing said average voltage being adapted to apply said average voltage to a control means, said control means being responsive to changes in said average voltage for applying said control signal to said variable delay stage.

4,479,217
MESSAGE IDENTIFICATION AND DATA ENTRY APPARATUS

Constantinos Philippides, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,316
Int. Cl.³ G06F 11/00
U.S. Cl. 371—67 **2 Claims**



1. Apparatus for the recognition and decoding of digital and analog information by comparing received data with a stored

data word and comparing bits of the received data with each other in a predetermined order, comprising:

first comparator circuit means for comparing received data with a stored data word and providing a message identification and acceptance output signal in response to a correlation between said received data and said stored data word,

second comparator circuit means for comparing bits of said received data with each other in a predetermined order and producing decoded output data in response to a correlation of the compared bits,

error detection circuit means coupled to the output of said first and second comparator circuit means and providing an output error signal when there is no data decoded from said second comparator circuit, and

data complement check clock generating means being connected to and being controlled by the output of said first comparator circuit means and having an output connected to said error detection circuit means for providing precise time synchronization between the outputs of said first and second comparator circuit means.

4,479,218

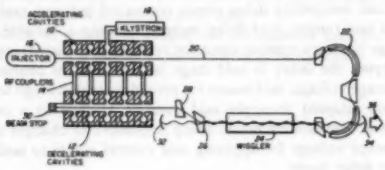
FREE ELECTRON LASER USING RF COUPLED ACCELERATING AND DECELERATING STRUCTURES

Charles A. Brau; Donald A. Swenson, and Thomas J. Boyd, Jr., all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 90,846, Nov. 2, 1979,. This application Jun. 19, 1981, Ser. No. 275,478

Int. Cl.³ H01S *3/00*

U.S. Cl. 372—2 **19 Claims**



1. An electron beam energy recovery system for a free electron laser comprising:

first cavity means for accelerating an electron beam;

a rf energy source;

second cavity means disposed adjacent said first cavity means, said second cavity means for decelerating said electron beam to extract rf energy from said electron beam to supplement rf energy supplied by said rf energy source to said first cavity means to accelerate said electron beam;

electron beam transport means for directing said electron beam from said first cavity means to said second cavity means;

whereby placement of said first cavity means adjacent said second cavity means reduces rf coupling losses to thereby enhance efficiency of said electron beam energy system.

4,479,219

EXCITATION CANCELLING FREE ELECTRON LASER

John M. J. Madey, 2120 Amherst St., Palo Alto, Calif. 94306

Filed Jun. 30, 1981, Ser. No. 279,122

Int. Cl.³ H01S *3/00*

U.S. Cl. 372—2 **14 Claims**

1. In a gain-expanded free electron laser including

means for providing an evacuated channel having a longitudinal axis,

means for injecting a relativistic electron beam characterized by a design energy $\gamma_0 mc^2$ into said channel in a direction generally parallel to the axis of said channel,

means for supporting an electromagnetic wave in at least a region of said channel, which electromagnetic wave is characterized by an optical axis generally parallel to the axis of said channel, and by an optical phase,

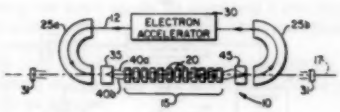
means for dispersing the electrons in transverse position at the entrance to said channel in proportion to said electrons' deviations in energy from said design energy,

magnet means for generating a magnetic field perpendicular to the axis of said channel, said magnetic field having

a periodic component B_0 which reverses periodically along said axis, though remaining constant in time, said periodic component being used to impart a periodic transverse motion and velocity to said electrons in said electron beam,

said periodic component being characterized by a transverse gradient k perpendicular to said magnetic field and the axis of said channel wherein said gradient and said dispersing means are used to selectively increase the transverse velocity of high energy electrons moving through said magnet means thereby maintaining constant longitudinal velocity for all electrons independent of initial energy,

said transverse gradient k in said periodic field deflecting said electrons towards a direction of lower magnetic field, and



a non-reversing component B_c with transverse gradient s, said non-reversing component opposing the deflection of said electron beam by said periodic component, said gradient s preserving the dispersion in energy and transverse position established at the start of said magnet means,

said evacuated channel, said supporting means, and said magnet means defining an interaction region of length L in which said electromagnetic wave exchanges energy with said electron beam,

said magnet means, said electromagnetic wave, and said electron beam being characterized by a net optical phase slip qL during the interaction between the phase of said electromagnetic wave and the phase of said electron transverse velocity, and a spatial frequency $\bar{\Lambda}$ for free betatron oscillations about the electrons' nominal trajectories, thereby defining a net betatron phase advance $\bar{\Lambda}L$,

the improvement wherein said net optical phase slip qL and said betatron phase advance $\bar{\Lambda}$ satisfy the following conditions:

$$|qL| = K\pi$$

$$|qL - \bar{\Lambda}L| = M2\pi$$

where K is an integer and M is any positive integer,

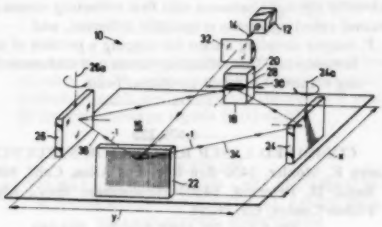
whereupon the excitation of the betatron motion excited during the passage of said electrons through said interaction region is suppressed.

4,479,220

METHOD AND APPARATUS FOR GENERATING ULTRA-SHORT INDIVIDUAL LASER PULSES

Zsolt Bor, and Fritz P. Schäfer, both of Goettingen, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft Zur Foerderung Der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,373
Int. Cl.[3] H01S *3/10*
U.S. Cl. 372—25 19 Claims



1. In a pulse laser system for generating laser output pulses, of the kind comprising:

an excitation radiation source including a pump laser generating an at least partially coherent primary beam of radiation pulses each having a half-amplitude duration many times greater than one hundred psec and a pulse sequence frequency of not more than one mHz;

beam divider means for dividing the primary beam into two generally coherent excitation beams;

a stimulatable active output laser medium; and

means, comprising two reversing mirrors, for directing the two excitation beams onto the active output laser medium to develop therein an interference pattern of predetermined spacing and hence a stimulation density distribution corresponding to that interference pattern;

the improvement comprising:

the beam divider being a high density diffraction grating; and

the excitation radiation source supplying primary radiation pulses each having a half-amplitude duration no greater than twenty nsec and an intensity such that the stimulation of the output laser medium exceeds its laser threshold by no more than twenty percent;

whereby the interference pattern is limited to intervals of a few nanoseconds and the system generates ultra-short individual output laser pulses each having a maximum half-amplitude duration of no more than one hundred psec at the pulse sequence frequency.

4,479,221

METHOD OF AND APPARATUS FOR REGULATING THE QUANTITY OF LIGHT OF AN ARRAY-LIKE LIGHT SOURCE

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

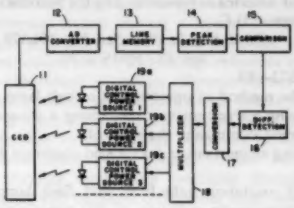
Filed Nov. 2, 1981, Ser. No. 317,385
Int. Cl.[3] H01S *3/13*
U.S. Cl. 372—31 6 Claims

1. A method of regulating the quantity of light emitted from each of a plurality of semiconductor lasers arranged in the form of an array, comprising the steps of:

detecting a rearwardly emitted beam from each of said semiconductor lasers with light detecting means provided rearwardly of said plurality of semiconductor lasers, said light detecting means generating a signal representing the quantity of light of the beam emitted from each said laser;

detecting a peak value of the quantity of light of the rearwardly emitted beam from each of said semiconductor lasers from the signal generated by said light detecting means; and

regulating the peak value of the quantity of light of the



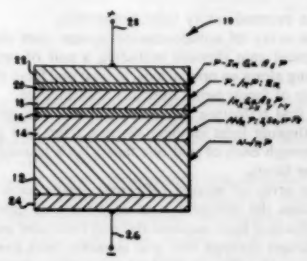
rearwardly emitted beam from each of said semiconductor lasers so that all said peak values are equal to one another, on the basis of the detected peak value of each of said semiconductor lasers.

4,479,222

DIFFUSION BARRIER FOR LONG WAVELENGTH LASER DIODES

Frank Z. Hawrylo, Trenton, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 27, 1982, Ser. No. 372,364
Int. Cl.[3] H01S *3/19*
U.S. Cl. 372—45 1 Claim



1. In an improved semiconductor laser diode in which a plurality of layers of semiconductor material are deposited by liquid phase epitaxy on a substrate to form an active lasing layer having heterojunction layers on each side thereof, the improvement comprising:

a first heterojunction layer having an n-type dopant therein to form a diffusion barrier, said first heterojunction layer being deposited on one side of said active lasing layer, said n-type dopant selected from the group consisting of sulfur, selenium and tellurium, the concentration of said n-type dopant being mid 10^{19} atoms per cubic centimeter; and

a second heterojunction layer having a p-type dopant therein, the concentration of said n-type dopant exceeding the concentration of said p-type dopant so that said p-type dopant does not diffuse into said first heterojunction layer, said second heterojunction layer being deposited on the other side of said active lasing layer.

4,479,223
ADAPTATION FOR IMPROVING LIFETIME OF DYE LASER USING COUMARIN DYES

Aaron N. Fletcher, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1982, Ser. No. 404,178
Int. Cl.³ H01S *3/20*
U.S. Cl. 372—53 **8 Claims**

1. In the method of operation of a flash lamp pumped dye laser, having a dye reservoir containing a coumarin dye, the improvement comprising the steps of:

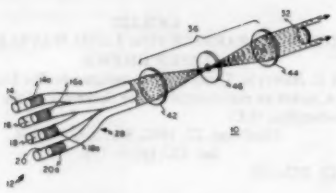
providing an inert cover gas for said coumarin dye reservoir; and

filtering excitation light from said flash lamp to prevent electromagnetic radiation of 300 nanometers or shorter wavelength from being transmitted to said dye laser whereby the method of operation results in superior effective coumarin dye lifetimes.

4,479,224
FIBER-COUPLED EXTERNAL CAVITY SEMICONDUCTOR LASER

Robert H. Rediker, Watertown, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 26, 1981, Ser. No. 315,145
Int. Cl.³ H01S *3/05*
U.S. Cl. 372—92 **8 Claims**



1. An external cavity laser, comprising:

A. an array of semiconductor optical gain elements, each optical gain element including a pair of opposing facets lying along an optical axis, at least one facet of each of said pair of facets being optically transmissive,

B. a first reflecting means lying across the optical axes for reflecting light incident thereon from said gain elements through each of said one facets back toward each of said one facets,

C. an array of second reflecting means, each means lying across the optical axis of an associated gain element for reflecting light incident thereon from said associated gain element through said gain elements back toward said one facet, thereby establishing an optical propagation path between the first reflecting means and the second reflecting means,

D. a first optical fiber bundle including a plurality of optical fibers disposed between said one facet of each gain element and said first reflecting means, each fiber of said first bundle having a first end near and optically coupled to the one facet of each associated gain element, and having a second end oriented with its optical axis substantially parallel to the corresponding ends of the other optical fibers in said first bundle, whereby said fibers of said first fiber bundle establish a portion of the optical propagation path being substantially equal to an integral number of wavelengths of the light generated by the respective ones of said gain elements,

E. a spatial filter disposed along said optical propagation path between said first fiber bundle and said first reflecting means, said spatial filter including means for receiving light from said first fiber bundle and for transmitting light to said first reflecting means, and means for receiving light from said first reflecting means and transmitting light to said first fiber bundle, said spatial filter including:

i. a pair of coaxial collimating lenses having optical axes parallel to said propagation path and being spaced apart along their optical axes by the sum of the focal lengths of said lenses, and

ii. a filter element disposed between said lenses substantially at the mutual focal point of said lenses, said filter element being matched to the Fraunhofer interference pattern associated with the array of fibers at said cavity end of said bundle,

whereby the light between said first reflecting means and said second refecting means is spatially coherent, and

F. output coupling means for tapping a portion of said light between said first reflecting means and said second reflecting means to provide an output beam.

4,479,225
COMBINED LASER RESONATOR STRUCTURE

Galen E. Mohler, 1450 Ben Roe, Los Altos, Calif. 94022, and Royal D. Peterson, 14105 Birmingham Hwy., Alpharetta, Fulton County, Ga. 30201

Filed Jun. 28, 1982, Ser. No. 393,040
Int. Cl.³ H01S *3/082*
U.S. Cl. 372—97 **13 Claims**

1. A laser construction comprising:

a first laser optical cavity which includes a plurality of spaced optical reflectors which define a first optical axis, and means for supporting a lasable medium along said first optical axis;

a second laser optical cavity which includes a second plurality of spaced optical reflectors which define a second optical axis, and means for supporting a lasable medium along said second optical axis; and

a single resonator structure upon which said optical reflectors of both said cavities are fixedly mounted to maintain said optical axes in a predetermined and rigid relationship to one another, said resonator structure comprising a framework having a plurality of spaced longitudinal members joined together by a plurality of spaced transverse members.

4,479,226
FREQUENCY-HOPPED SINGLE SIDEBAND MOBILE RADIO SYSTEM

Vasant K. Prabhu, Holmdel, and Raymond Steele, Hazlet, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

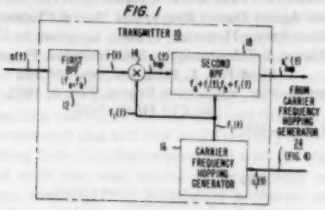
Filed Mar. 29, 1982, Ser. No. 363,273
Int. Cl.³ H04K *1/00*
U.S. Cl. 375—1 **11 Claims**

6. A communication system employing single sideband modulation, comprising

a plurality of M mobile units, each mobile unit capable of accepting a separate message signal ($s_1(t)$–$s_m(t)$), multiplying means in each mobile unit for multiplying a separate message signal by a separate one of a plurality of M distinct carrier-frequency-hopping sequences ($f_1(t)$–$f_m(t)$) to produce as an output a separate one of a plurality of M

unique carrier-frequency-hopped single sideband signals ($s'_{hop,1}(t)$–$s'_{hop,M}(t)$); and

FIG. 1



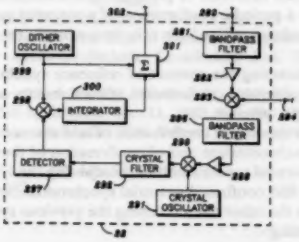
a base station responsive to and capable of demodulating said plurality of M unique carrier-frequency-hopped single sideband signals and recovering therefrom a plurality of M separate message signals ($s_1(t)$–$s_m(t)$).

4,479,227

AUTO-BALANCE METHOD AND APPARATUS FOR SUPPRESSION OF RESIDUAL LINES IN A TRANSMITTED SPECTRUM

John E. Bjornholt, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1982, Ser. No. 414,186
Int. Cl.³ H04K 1/00
U.S. Cl. 375—1 14 Claims



1. An auto-balance apparatus for suppression of a residual carrier line in a signal spectrum around a carrier frequency comprising:

means for obtaining a narrow-band frequency sample of the signal spectrum around the carrier frequency;

a source of a dither signal;

a multiplier coupled to said means for obtaining a narrow-band frequency sample and coupled to said source of a dither signal;

an integrator coupled to said multiplier; and

a summing device coupled to said source of a dither signal and coupled to said integrator.

4,479,228

LOCAL COMPUTER NETWORK TRANSCEIVER

Ronald C. Crane, Mountain View, Calif., assignor to 3Com Corporation, Mountain View, Calif.

Filed Mar. 11, 1981, Ser. No. 242,708
Int. Cl.³ H04L 23/00
U.S. Cl. 375—7 8 Claims

1. A local computer network coaxial cable transceiver for connection to a coaxial cable, said transceiver comprising:

a transmitter constructed from

a transmitter balanced line receiver termination circuit, said transmitter balanced line receiver termination circuit having a balanced differential input port for connecting to a first host CPU controller interface, and a balanced differential output port;

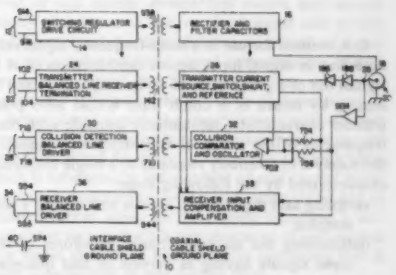
a transmitter isolation transformer having a balanced differential input side and a balanced differential output side, said balanced differential input side being connected to said balanced differential output port of said transmitter balanced line receiver termination circuit; and

a transmitter current source, switch and voltage reference circuit, said transmitter current source, switch and voltage reference circuit having a balanced differential signal input port and a signal output port, said transmitter current source, switch and voltage reference circuit having a switch means, a voltage reference means and a current source means, said current source means being operative to develop a current, said current being developed from reference to said voltage reference means, said current source means being coupled to said switch means for controlling signal path switching through said switch means, said balanced differential input port of said transmitter current source, switch and voltage circuit being connected to said balanced differential output side of said transmitter isolation transformer, and said signal output port of said transmitter current source, switch and voltage reference circuit being adapted for direct current coupling to said coaxial cable;

a receiver constructed from

a receiver balanced line driver circuit, said receiver balanced line driver circuit having a balanced differential output port for connecting to a second host CPU controller interface and a balanced differential input port,

a receiver isolation transformer having a balanced differential input side and a balanced differential output side, said balanced differential output side being connected to said balanced differential input port of said receiver balanced line driver, and


SWITCHING REGULATOR DRIVE CIRCUIT
RECTIFIER AND FILTER CAPACITORS
TRANSMITTER BALANCED LINE RECEIVER TERMINATION
TRANSMITTER CURRENT SOURCE, SWITCH, SHUNT, AND REFERENCE
COLLISION DETECTION BALANCED LINE DRIVER
COLLISION COMPARATOR AND OSCILLATOR
RECEIVER BALANCED LINE DRIVER
RECEIVER INPUT COMPENSATION AND AMPLIFIER
INTERFACE CABLE SHIELD GROUND PLANE
COAXIAL CABLE SHIELD GROUND PLANE

a receiver input compensation and amplifier circuit, said receiver compensation and amplifier circuit having a balanced differential output port coupled to said balanced differential input side of said receiver isolation transformer, said receiver input compensation and amplifier circuit having a signal input port adapted to be direct current coupled to said coaxial cable; and

a collision detection circuit constructed from

a collision detection balanced line driver, said collision detection balanced line driver having a balanced differential output port coupled to a third host CPU controller interface,

a collision detection isolation transformer having a balanced differential output side coupled to a balanced differential input port of said collision detection balanced line driver, and a balanced differential input side, and

a collision comparator and oscillator circuit, said collision comparator and oscillator circuit having a balanced differential output port coupled to the balanced differential input side of said collision detection isolation transformer, and having a signal input port adapted to be DC coupled to said coaxial cable;

wherein said transmitter isolation transformer, said receiver

isolation transformer and said collision detection isolation transformer form a division between a ground plane associated with a host CPU controller interface and a ground plane associated with said coaxial cable.

4,479,229

ARRANGEMENT FOR AND METHOD OF DETECTING MULTI-FREQUENCY SOUND CODE SIGNALS

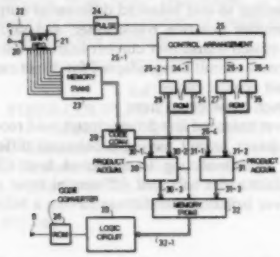
Gerardus A. M. Wolters, Lith, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,567

Claims priority, application Netherlands, Jan. 8, 1982, 8200051

Int. Cl.³ H04L 5/06

U.S. Cl. 375—89 **1 Claim**



1. A method for use in a multi-frequency signal receiver for detecting in digital input signals combinations of at least two signals out of a group of multi-frequency signals and for determining by means of a comb filter whose zero points in its transfer characteristic substantially coincide with the nominal frequencies of the group of multi-frequency signals whether the receiver erroneously responds to a single frequency signal, characterized by the following steps:

sampling said digital input signals and storing a plurality of samples;

determining the discrete Fourier transform of the digital input signals having as kernels of said discrete Fourier transform the expressions:

$$\sum_{k=0}^{k=p} w(n,T)\,(-1)^k \sin[2\pi(f_0 - \delta f/2 + k\delta f)\cdot nT] \text{ and}$$

$$\sum_{k=0}^{k=p} w(n,T)\,(-1)^k \cos[2\pi(f_0 - \delta f/2 + k\delta f)\cdot nT]$$

where w(n,T) is a predetermined window signal,

p is the number of multi-frequency signals,

fo is the lowest multi-frequency signal frequency from the group of multi-frequency code signals,

δf is the frequency difference between the two frequency-consecutive multi-frequency signals,

T is the period of time between two consecutive samples of the digital input signals, and n is the number of the samples of the input signals:

determining from the discrete Fourier transformed input signals a signal which is proportional to the power of the selected frequency component;

comparing said proportional signal with the sum of the powers of the multi-frequency signals of a detected multi-frequency code signal combination;

and invalidating the detected multi-frequency code signal combination when said proportional signal has a value which exceeds a threshold value dependent on the value of the said sum.

4,479,230

PROCESS AND APPARATUS FOR THE SYNCHRONIZATION ON RECEPTION OF A SIGNAL PROVIDED WITH A SYNCHRONIZATION PATTERN

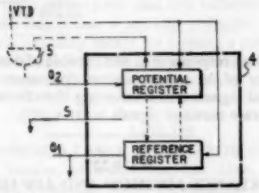
Christian Auzet; Daniel Rusch, and Daniel Chabernaud, all of Conflans-Sainte-Honorine, France, assignors to Lignes Telegraphiques & Telephoniques, Ste-Honorine, France

Filed Feb. 1, 1982, Ser. No. 344,310

Claims priority, application France, Feb. 6, 1981, 81 02412

Int. Cl.³ H04L 7/00

U.S. Cl. 375—108 **13 Claims**



1. A process for the synchronization on reception of a transmission signal involving the operation of decoding a periodically appearing synchronization pattern and an operation involving a logic synchronization cycle particularly checking a synchronization loss and resumption criterion and producing a periodic detection of a reference synchronization pattern, a permanent detection of potential synchronization patterns, as well as a periodic confirmation of a potential sunchronization in accordance with a logic criterion, wherein the cycle consists of:

(a) detecting the absence of reference synchronization and producing a confirmation of said absence according to a logic criterion,

(b) in the case of confirmation of said absence of a reference synchronization and of confirmation of the presence of a potential synchronization, readjusting the synchronization to said confirmed potential synchronization,

(c) in the other cases retaining the previous synchronization setting.

4,479,231

METHOD FOR THE PRODUCTION OF X-RAY IMAGES AND X-RAY TELEVISION APPARATUS FOR CARRYING OUT SAID METHOD

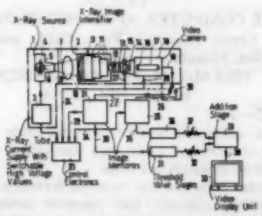
Joerg Haendle, Erlangen, and Wolfgang Maass, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,282

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3141041

Int. Cl.³ G03B 41/16

U.S. Cl. 378—99 **4 Claims**



1. An X-ray diagnostic installation comprising a fluoroscopy apparatus with a radiation source which alternately emits

X-radiation produced with a high tube voltage and with a low tube voltage, and an X-ray image intensifier television chain which includes an X-ray image intensifier, a video camera, and a video display unit, said video camera supplying respective first and second image signals resulting respectively from X-radiation produced with the high tube voltage and produced with the low tube voltage, first and second image memories for storing respective first and second images, a switch for alternately connecting said video camera with said first and second image memories such that said first image memory stores a first image resulting from X-radiation produced with the high tube voltage and such that said second image memory stores a second image resulting from X-radiation produced with the low tube voltage, and first and second threshold value circuits connected between the first and second image memories, respectively, and the video display unit, said first and second threshold value circuits having first and second threshold values and supplying to the video display unit only those portions of the first image which fall below the first threshold and only those portions of the second image which exceed the second threshold to produce a resultant image on the video display unit.

4,479,232

MEANS FOR HOLDING X-RAY FILMS

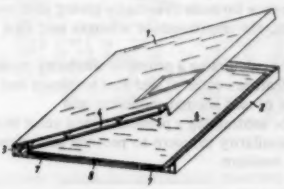
Walter Bauer, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 199,378, Oct. 21, 1980, Pat. No. 4,408,340. This application Apr. 11, 1983, Ser. No. 483,884

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1979, 2943853

Int. Cl.³ G03B 41/16

U.S. Cl. 378—187 **16 Claims**



1. An arrangement for holding sheet-like x-ray films, said arrangement comprising:

(a) a support;

(b) a magnetic layer provided on said support; and

(c) a flexible laminate including a flexible intensifier screen, a flexible ferromagnetic layer, and a substantially flat, flexible receptacle for said ferromagnetic layer having one side which is secured to said support, said ferromagnetic layer being disposed between said one side and said flexible intensifier screen and being confined by said receptacle in such a manner as to have freedom of movement relative to the latter and to said flexible intensifier screen, and at least one of said layers being movable towards and away from the other of said layers, said support having a first wall, a second wall movable relative to said first wall, said magnetic layer being disposed between said flexible intensifier screen and one of said walls, said laminate being secured to the other of said walls, and said magnetic layer and said flexible intensifier screen being located on opposite sides of a film placed in said support.

4,479,233

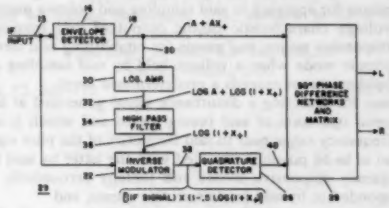
DISTORTION CORRECTING AM STEREO RECEIVER WITH NON-FLAT AGC

Bernard D. Loughlin, Centerport, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,332

Int. Cl.³ H04H 5/00

U.S. Cl. 381—15 **11 Claims**



1. In a receiver for receiving a composite signal having a carrier which has been amplitude modulated with a first modulating signal and angle modulated with a second modulating signal, wherein there are provided first means for demodulating said received signal to obtain a first demodulated signal representative of said first modulating signal, said first demodulated signal also having a characteristic which is dependent on the level of said carrier at said first means, and second means, jointly responsive to said received signal and to said first demodulated signal, for demodulating said received signal to obtain a second demodulated signal representative of said second modulating signal, but having distortion correction which is adversely affected by the carrier level dependency of said first demodulated signal, the improvement wherein said second demodulating means includes means responsive to said first demodulated signal for deriving therefrom a modification signal which is substantially independent of said carrier level, and means, jointly responsive to said modification signal and to said modulated carrier signal for developing therefrom a second demodulated signal which is representative of said second modulating signal and which has distortion correction that is substantially independent of said carrier level.

4,479,234

AM STEREOPHONIC DEMODULATING CIRCUIT

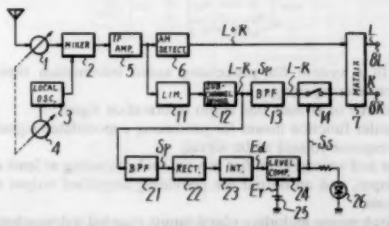
Satoshi Yokoya, Chofu, and Norio Numata, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,894

Claims priority, application Japan, Mar. 20, 1981, 56-41280

Int. Cl.³ H04H 5/00

U.S. Cl. 381—15 **12 Claims**



1. A radio receiver having monaural and stereophonic modes for respectively demodulating a monaural broadcast signal having a carrier modulated with a monaural signal and demodulating an AM stereophonic broadcast signal having a carrier modulated with the sum and difference of left and right

channel stereophonic signals and with a relatively low frequency pilot signal, comprising:

tuning means operable for tuning the receiver to receive a broadcast signal with a carrier of a selected frequency;

frequency responsive means for extracting said pilot signal from the received broadcast signal when the latter is an AM stereophonic broadcast signal;

mode selecting means for establishing said stereophonic mode in response to the extracted pilot signal, said mode selecting means including sampling and holding means, means for applying to said sampling and holding means a voltage characteristic of the output of said frequency responsive means, and means for establishing said stereophonic mode when a voltage held by said sampling and holding means exceeds a predetermined level;

means for detecting a disturbance signal generated at least upon operation of said tuning means and which is in a frequency range near to said frequency of the pilot signal so as to be possibly extracted with the latter by said frequency responsive means and thereby erroneously responded to by said mode selecting means; and

means responsive to the detected disturbance signal when the received broadcast signal is a monaural signal for preventing erroneous establishment of said stereophonic mode by said mode selecting means, including means responsive to the detected disturbance signal for operating said sampling and holding means to sample and hold the level of said voltage characteristic of said output of the frequency responsive means existing immediately before the occurrence of said detected disturbance signal.

4,479,235

SWITCHING ARRANGEMENT FOR A STEREOPHONIC SOUND SYNTHESIZER

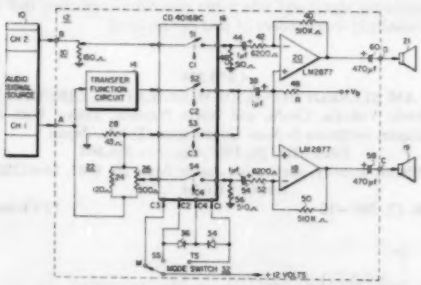
Patrick D. Griffis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,180

Claims priority, application United Kingdom, May 8, 1981, 8114088

Int. Cl.³ H04R *5/00*

U.S. Cl. 381—17 **13 Claims**



1. In a system for processing audio information signals, apparatus comprising:

a source of at least one audio information signal;

transfer function means for producing a modulated signal in response to said audio signal;

first and second amplifier means, each including at least one input, and an output for providing amplified output signals;

switch means including plural inputs coupled independent of each other to said source of audio signal and said transfer function means, respectively, for selectively coupling said audio signal and said modulated signal to said amplifier means inputs, and which in a first position couples said audio signal and said modulated signal to said inputs of said first and second amplifier means for causing said first amplifier means to combine said input signals and thereby provide as said output signals of said first and second amplifier means first and second synthesized stereophonic signals, respectively; and which in a second position couples said audio signal to the input of at least one of said first and second amplifier means inputs for causing said one of said first and second amplifier means to amplify said audio signal and thereby provide as said respective output signal said audio signal.

4,479,236

PATTERN MATCHING DEVICE OPERABLE WITH SIGNALS OF A COMPRESSED DYNAMIC RANGE

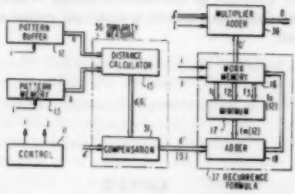
Hiroaki Sakoe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,447

Claims priority, application Japan, Feb. 17, 1981, 56-21987

Int. Cl.³ G06K *9/00*

U.S. Cl. 381—43 **5 Claims**



1. In a pattern matching device for calculating an overall similarity measure between a first and a second pattern represented by a first and a second sequence of feature vectors, respectively, said device comprising first means for calculating an elementary similarity measure between each feature vector of said first sequence and each feature vector of said second sequence, and second means for iteratively calculating a recurrence formula which defines a recurrence value by a sum of each elementary similarity means and an extremum of a prescribed number of previously calculated recurrence values, said recurrence formula eventually giving said overall similarity measure, the improvement wherein said first means comprises:

means for calculating a primitive similarity measure between each feature vector of said first sequence and each feature vector of said second sequence; and

means for subtracting a predetermined value from said primitive similarity measure to provide said elementary similarity measure.

4,479,237

AUTOMATIC SOUND LEVEL CONTROL SYSTEM FOR AUDIO EQUIPMENT

Fukashi Sugasawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 12, 1982, Ser. No. 348,257

Claims priority, application Japan, Feb. 18, 1981, 56-22420

Int. Cl.³ H03G *1/02*

U.S. Cl. 381—57 **8 Claims**

1. An automatic sound level control system for audio equipment, comprising:

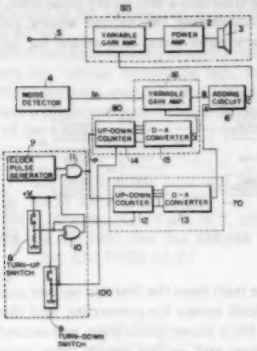
a noise level detection means for producing an ambient noise signal indicative of an ambient noise level;

a manually operable sound level setting means for producing a sound level set signal;

a gain control means responsive to said ambient noise signal and said sound level set signal for producing a gain control signal; and

a variable gain amplifier for amplifying an audio input signal in response to said gain control signal in a manner that the output level of said variable gain amplifier increases with

an increase in the ambient noise level and the rate at which said output level increases with an increase in ambient noise level is variable in response to said sound level set signal, wherein said rate at which said output level increases with an increase in ambient noise is relatively high when the sound level determined by said sound level set signal is low, while said rate is relatively low when said sound level determined by said sound level set signal is high.



4,479,238

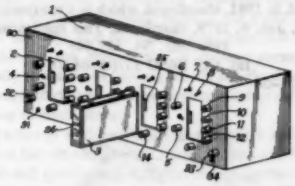
AUDIO EFFECTS SYSTEM AND METHOD

Abner Spector, 250 174th St. #1904, Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 420,846, Sep. 21, 1982, , which is a continuation-in-part of Ser. No. 150,813, May 19, 1980, Pat. No. 4,388,490. This application Jun. 13, 1983, Ser. No. 503,842

Int. Cl.³ H04R *3/12*

U.S. Cl. 381—61 **7 Claims**



1. An electronic system for operatively inserting at least one audio effects circuit module into a main audio path having a source audio signal, comprising:

a main housing having an audio signal input, and an audio signal output associated with the audio signal path for carrying the source audio signal between said input and said output;

at least one audio effects circuit module for modifying audio signals, said module having a plurality of electrical contact elements;

said main housing further having at least one module receiving recess for receiving and releaseably engaging said module, said recess having corresponding electrical contact elements for mating with said module contact elements in a fully engaged position;

and recess switching means associated with said recess, said switching means including means for connecting the main audio path together between an input and output of said receiving means, said switching means further including means for breaking the audio path between said recess input and output and for routing said audio signal through said module only when said module contact elements are fully mated with said recess contact elements, wherein said recess switching means includes position detecting means for detecting when said module is in a fully-mated position in said recess and for providing a control signal, and wherein said recess switching means includes electronic switching means in said audio signal path associated with said recess for routing said audio signal through said module in response to said control signal.

4,479,239

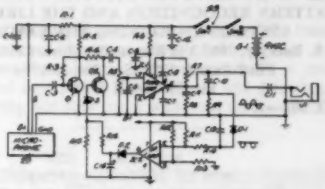
SOUND DETECTING DEVICE

David W. Rhines, Sheboygan, Wis., assignor to Silver Creek Nurseries, Inc., Manitowoc, Wis.

Filed Mar. 28, 1983, Ser. No. 479,295

Int. Cl.³ H03G *3/00*

U.S. Cl. 381—72 **12 Claims**



1. A sound detecting device, comprising:

A. microphone means for being directed toward a source of sound to produce a corresponding electrical input signal;

B. amplifier means having an input and an output, said input being connected to said microphone means to receive said input signal and said output providing an output signal; and

C. a loud sound suppressing circuit operatively associated with said amplifier means for temporarily shunting said input signal to ground while said output signal exceeds a predetermined level.

4,479,240

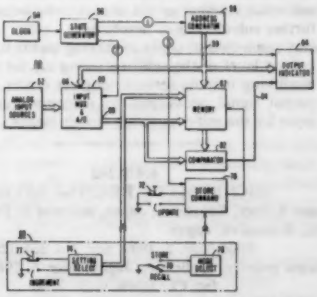
AUDIO MIXING CONSOLE WITH CONTROL ELEMENT POSITION STORAGE

Robert H. McKinley, Jr., 467 W. 38th St., Houston, Tex. 77018

Filed Sep. 29, 1981, Ser. No. 306,689

Int. Cl.³ H04B *3/00, 1/00*

U.S. Cl. 381—80 **19 Claims**



14. A portable audio mixing console, comprising:

a plurality of input modules, including a plurality of control elements;

a plurality of output modules, including a plurality of control elements;

means forming a part of said console for storing a first plural-

ity of control element positions, said first plurality of positions comprising a single setup position for control elements on a first module of said pluralities of modules;

means forming a part of said console for storing a second plurality of control element positions, said second plurality of positions comprising a single setup position for control elements on said first module;

means forming a part of said console for selectively retrieving said first or second plurality of stored control element positions; and

means for displaying adjacent to control elements a comparison between the stored setup position and the present position thereof, whereby the control elements may be adjusted to the setup position.

4,479,241

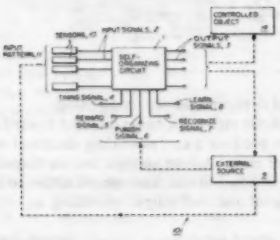
SELF-ORGANIZING CIRCUITS FOR AUTOMATIC PATTERN RECOGNITION AND THE LIKE AND SYSTEMS EMBODYING THE SAME

Bruce S. Buckley, 7067 Via Blanca, San Jose, Calif. 95139

Filed Aug. 6, 1981, Ser. No. 290,784

Int. Cl.³ G06K *9/66*

U.S. Cl. 382—15 **44 Claims**



1. A system that comprises:

transducer means to sense an input thereto and operable to provide a first output signal representative of said input;

self-organizing circuit means connected to receive said first output signal and operable to effect analysis of constituent elements of said input and provide a further output signal related to said input, each self-organizing circuit of said self-organizing circuit means including a plurality of sub-circuits or levels which are connected to receive messages from some other sub-circuit or level and are operable to deliver messages to some other sub-circuit or level, there being voting in that each sub-circuit or level weights relative amounts of negative and positive inputs thereto and votes whether or not to pass along information to the further sub-circuits or levels; and

means connected to apply modifying inputs to each sub-circuit or level of the self-organizing circuit means, which modifying innputs serve to correct errors in the further output signal occasioned by inaccurate analysis of the input by the self-organizing circuit means.

4,479,242

DICHROMATIC READING DEVICE

Masami Kurata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Kanagawa, Japan

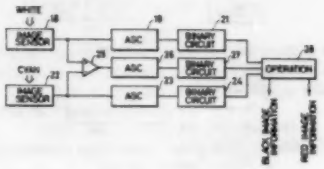
Filed Mar. 2, 1982, Ser. No. 354,325

Claims priority, application Japan, Mar. 6, 1981, 56-31334

Int. Cl.³ G06K *9/20, 7/00*

U.S. Cl. 382—17 **9 Claims**

1. A dichromatic reading device for use with variously colored information bearing sheets, comprising: a first image sensor responsive to light reflected directly from a sheet to produce a first analog pulse train containing plural pulses, each corresponding to a different color component of the reflected light, filter means capable of blocking a first color component of the reflected light, a second image sensor responsive to the reflected light after having passed through said filter means, to produce a second analog pulse train containing plural pulses, each corresponding to a different color component of the reflected light, first threshold means for converting the first analog pulse train into a first binary pulse train, second thresold means for converting the second analog pulse train into a second binary pulse train, first means for producing a third



analog pulse train from the first and second analog pulse trains, third threshold means for converting said third analog pulse train into a third binary pulse train, and second means responsive to at least said second binary pulse train and said third binary pulse train to produce a first color printing signal when the device is scanning the information printed on the sheet in said first color, and a second printing signal when the device is scanning information printed on the sheet in colors other than the first color.

4,479,243

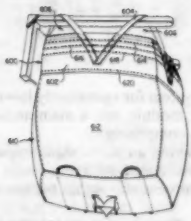
COLLAPSIBLE RECEPTACLE WITH PREFABRICATED LIFT LOOPS AND METHOD OF MAKING

Norwin C. Derby, and Robert R. Williamson, both of Dallas, Tex., assignors to Super Sack Manufacturing Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 376,004, May 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 336,455, Dec. 31, 1981, , which is a continuation-in-part of Ser. No. 281,406, Jul. 8, 1981, abandoned, which is a continuation of Ser. No. 46,822, Jun. 8, 1979, abandoned. This application Feb. 17, 1983, Ser. No. 467,445

Int. Cl.³ B65D *33/06, 88/16*

U.S. Cl. 383—24 **63 Claims**



13. A collapsible receptacle comprising:

a tubular receptacle side wall formed from fabric and having a predetermined circumference;

a length of fabric material having a length at least as long as the circumference of the tubular receptacle side wall and secured to the upper portion of the tubular receptacle side wall;

a length of webbing material secured to the length of fabric material in the form of a series of substantially equally sized, substantially equally spaced lift loops having lowermost ends;

each of the lift loops comprising the length of webbing material including attached portions at the opposite ends

thereof and an unattached central portion extending above the upper end of the tubular receptacle side wall;

each end portion of each lift loop comprising the length of webbing material being secured to the length of fabric material at a predetermined angle with respect to a line extending normal to the longitudinal axis of the length of fabric material; and

at least one line of stitching forming at least a partial connection between the tubular receptacle side wall and the length of fabric material, said line of stitching being positioned at least a predetermined distance below the lowermost ends of the lift loops.

4,479,244

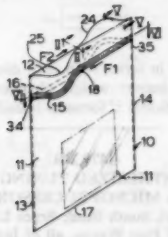
EASY OPENING BAG

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021

Filed Sep. 30, 1982, Ser. No. 430,944

Int. Cl.³ B65D *33/24*

U.S. Cl. 383—63 **10 Claims**



1. An improved reclosable bag construction comprising in combination:

a bag having front and back walls attached by seams at their side edges;

continuous elongate interlocking separable rib and groove elements along confronting faces of the walls adjacent the top of the bag; said rib and groove elements being interlockable by the application of closing pressure applied laterally to the walls forcing the rib interlockingly into the groove; said rib and groove elements being axially slidable relative to each other;

and a frictional surface means at the outer surface of said walls at the rib and groove for applying local forces along the rib and groove at a force location intermediate the bag edges in opposing directions parallel to the rib and groove so that said rib and groove will separate laterally between said force location and the bag edges.

4,479,245

SAME FREQUENCY REPEATER FOR A MULTIPLE REPEATER SYSTEM

Percy P. Batlivala, Arlington Heights, and Richard S. Kommrusch, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1982, Ser. No. 451,678

Int. Cl.³ H04B *7/14*

U.S. Cl. 455—18 **8 Claims**

1. A same frequency repeater comprising:

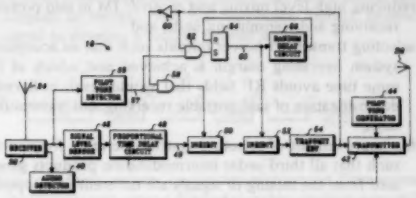
(a) a receiver for receiving a signal carrying information at a given frequency;

(b) a transmitter for transmitting an output signal carrying said information at said given frequency;

(c) means for sensing the magnitude of said received signal;

(d) means for keying said transmitter in respone to said receiver receiving said signal, said keying means delaying the keying of said transmitter from the time that said receiver receives said signal for a time period having a duration inversely proportional to the magnitude of said received signal as sensed by said sensing means

(e) means coupled to said receiver for detecting if a predetermined pilot signal is carried by said received signal;



(f) means for encoding said output signal of the transmitter with said predetermined pilot signal; and

(g) means for unkeying said transmitter for a randomly selected time period in response to said detecting means detecting said pilot signal while said transmitter is keyed.

4,479,246

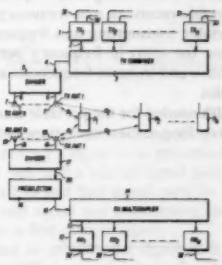
COMMUNICATION SYSTEM TO SIMULTANEOUSLY OPERATE A PLURALITY OF RF TRANSCEIVERS IN A CONFINED AREA

Michael F. Young, Staten Island, N.Y., assignor to Buttonwood Communication Corporation, Staten Island, N.Y.

Continuation of Ser. No. 286,256, Jul. 31, 1981,. This application Aug. 29, 1983, Ser. No. 527,199

Int. Cl.³ H04B *1/50, 15/00*

U.S. Cl. 455—50 **2 Claims**



1. In a method of eliminating interference in a wireless communication system located in a predetermined dimensioned enclosed area wherein said system includes

at least three portable receiving and transmitting units;

at least three base receiving means;

at least three base transmitting means;

base transmitter radiating means;

base receiver radiating means; and

portable receiver and transmitter radiating means wherein all of said portable receiving and transmitting units, said base receiving means and said base transmitting means can operate simultaneously when there is movement of said portable units in said predetermined dimensional enclosed area comprising the steps of:

connecting the output signal of each of said base transmitting means to its respective signal radiating means;

connecting the input signal of each of said base receiving means to its respective signal radiating means;

connecting the output and input signals of each of said portable receiving and transmitting units to its respective signal radiating means;

positioning said base transmitter radiating means and said base receiver radiating means so that the difference between the minimum propagation loss and the maximum

propagation loss between said base transmitter radiating means and portable receiver and transmitter radiating means is minimized and the difference between said base receiver radiating means and said portable receiver and transmitter radiating means is minimized;

reducing high level mixing and receiver IM in said portable receiving and transmitting units; and

selecting transmitter power outputs such that an acceptable system operating margin is achieved and which at the same time avoids RF fields that would result in harmful desensitization of said portable receiving and transmitting units;

the improvement of selecting system operating frequencies such that all third order intermodulation products generated from the mixing of signals are different from operating frequencies of any of said portable receiving and transmitting units is achieved in accordance with the formulas:

$$2F_2-F_3=F_4$$

$$F_2-S=F_1$$

$$S+F_3=F_4$$

$$F_2+B=F_4$$

$$(m-1)d+F_1=F_m$$

where

Fm=A portable receive frequency as m goes from 1 to N

d=the channel spacing which is the difference frequency between two adjacent operating frequencies

F_1=lowest portable receiving unit frequency

F_2=lowest portable transmitting unit frequency

F_3=highest portable receiving unit frequency

F_4=highest portable transmitting unit frequency

S=the separation (or split) in frequency between a given portable's receive and transmit frequencies and is the same for all portables

B=the bandwidth needed for the portable transmit frequencies (or receive frequencies since they only differ by a constant S).

4,479,247

ELECTRONIC CHANNEL SELECTOR

Noel A. Rogers, 9121 W. 70th St., Shawnee Mission, Kans. 66204

Filed Nov. 19, 1982, Ser. No. 442,960
Int. Cl.³ H04B 1/26
U.S. Cl. 455—179 **10 Claims**

1. An electronic channel selector for selecting one of a plurality of channels comprising:

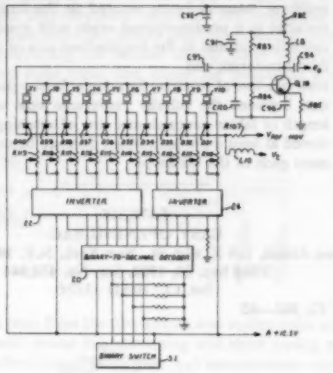
a plurality of diodes, each diode corresponding to one of said plurality of channels;

a plurality of crystals, each crystal corresponding to one of said plurality of channels and being connected in series with a corresponding one of said plurality of diodes;

means for setting a selected one of said plurality of channels;

means, responsive to said setting means, for forward biasing the diode corresponding to said selected channel and for reverse biasing the diodes not corresponding to said selected channel;

oscillator circuit means, connected to all of said crystals, for oscillating at a frequency determined by said crystal corresponding to said forward biased diode; and



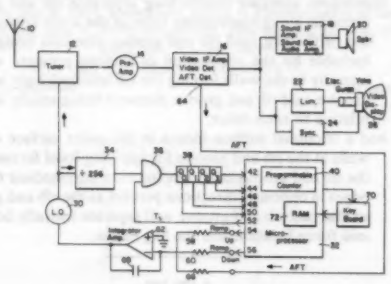
means connected in series with each diode for providing a tuning signal output which changes depending upon which of said diodes is forward biased.

4,479,248

FREQUENCY SYNTHESIZED TUNING SYSTEM USING A MICROPROCESSOR

Frederick W. Caspari, South Bend; Bruce E. Smith, and Daniel A. Heuer, both of Fort Wayne, all of Ind., assignors to The Magnavox Company, New York, N.Y.

Continuation of Ser. No. 183,867, Sep. 4, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,330
Int. Cl.³ H04B 1/26
U.S. Cl. 455—183 **2 Claims**



1. A frequency synthesized tuning system for tuning to a preselected frequency comprising a variable oscillator and a microprocessor coupled to said variable oscillator for the control thereof, said microprocessor having a programmable counter therein, characterized in that said tuning system further comprises a fixed divider for receiving an output signal from said variable oscillator, a fixed modulus counter cascaded with said programmable counter for extending the range thereof, and gating means connected between said fixed divider and said fixed modulus counter for allowing the application of the output from said divider to said fixed modulus counter for a specified period of time, whereby said programmable counter along with said fixed divider, said gating means and said fixed modulus counter in effect measures the frequency of the output signal of said variable oscillator such that said microprocessor may then compare the frequency of said oscillator output signal with said preselected frequency and

then, based on said comparison, generate a correction signal for said oscillator thereby effecting the tuning function of said tuning system substantially within said microprocessor.

4,479,249

APPARATUS FOR COLLECTING AND PROCESSING MESSAGES TRANSMITTED AT DIFFERENT SIGNAL FREQUENCIES

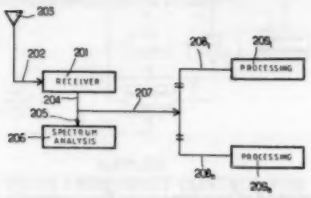
Michel Geesen, Antony; Jacques Mourant, Maurepas, and Daniel P. Ludwig, Ramonville-Saint-Agne, all of France, assignors to Electronique Marcel Dassault and Centre National d'Etudes Spatiales, both of Paris, France

Continuation-in-part of Ser. No. 38,748, May 14, 1979, abandoned, Ser. No. 166,621, Jul. 7, 1980, Pat. No. 4,398,286, which is a continuation-in-part of Ser. No. 38,770, May 14, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,548

Claims priority, application France, May 16, 1978, 78 14339; May 17, 1978, 78 14626

Int. Cl.³ H04B 1/16

U.S. Cl. 455—208 **15 Claims**



1. An apparatus for receiving messages transmitted from a plurality of radio signal sources operating at different frequencies within a predetermined frequency band comprising:

means for receiving said radio signals lying within said radio frequency band;

means for frequency scanning the signal provided by said means for receiving for determining frequency information identifying a frequency range for each of said signals;

a demodulating phase locked loop connected to receive said signals from said means for receiving, including a voltage controlled oscillator, an input mixer having one input to receive said radio signals and another input to receive a signal from said voltage controlled oscillator, a phase comparator for comparing an output signal of said mixer with a reference signal and supplying an error signal to said voltage controlled oscillator, said error signal representing phase modulation included on one of said radio frequency signals;

means coupled to said voltage controlled oscillator for establishing an initial operating frequency of said voltage controlled oscillator of said demodulating phase locked loop in response to said frequency information determined by said means for frequency scanning; and

means coupled to the voltage controlled oscillator for resetting the output signal frequency of said voltage controlled oscillator to a value independent of the frequency of said radio signals.

4,479,250

DUAL AUDIO CAPTURE LIMITER SQUELCH CIRCUIT

Steven P. Flood, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 10, 1983, Ser. No. 503,207

Int. Cl.³ H04B 1/10

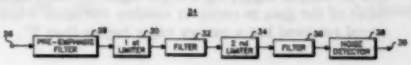
U.S. Cl. 455—213 **5 Claims**

1. A communications receiver squelch circuit for preventing the receiver from producing audio-frequency output in the absence of a frequency modulated carrier signal comprising:

(a) first filter means adapted to receive a receiver discriminator output signal to develop a first filtered signal;

(b) first limiter means coupled to said first filter means for limiting said first filtered signal to produce a first amplitude limited, filtered signal;

(c) second filter means coupled to said first limiter means and adapted to receive said first amplitude limited, filtered signal to develop a second filtered signal;



(d) second limiter means coupled to said second filter means for limiting said second filtered signal to produce a second amplitude limited, filtered signal;

(e) third filter means coupled to said second limiter means and adapted to receive said second amplitude limited, filtered signal to develop a third filtered signal; and

(f) detector means coupled to said third filter means for detecting peaks in said third filtered signal which exceed a predetermined amplitude to produce a squelch control voltage.

4,479,251

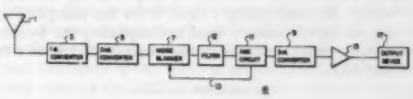
NOISE BLANKER

Sylvan L. Dawson, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 6, 1982, Ser. No. 395,221

Int. Cl.³ H04B 1/10

U.S. Cl. 455—219 **7 Claims**



1. A signal processing system comprising:

means for receiving a signal to be processed and including a first signal path and a second signal path;

means coupled to said first signal path for providing a first output of said signal and interrupting said first output in response to a first control signal;

means coupled to said second signal path for providing a variably amplified second output of said signal to be processed which is variable in response to a second control signal;

means for comparing the second output with a reference signal for generating said first control signal; and

means coupled to said means for providing said first output for providing an automatic gain control signal and variably amplifying said first output in response to said automatic gain control signal, said automatic gain control signal also being coupled as said second control signal.

4,479,252

DEVICE FOR REDUCTION OF THE FALSE ALARM RATIO AND MONITOR RECEIVER COMPRISING SUCH A DEVICE OF THIS NATURE

Philippe Souchay, and Maurice Glorie, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 28, 1982, Ser. No. 425,512

Claims priority, application France, Oct. 9, 1981, 81 19703

Int. Cl.³ H04B 1/10, 17/00

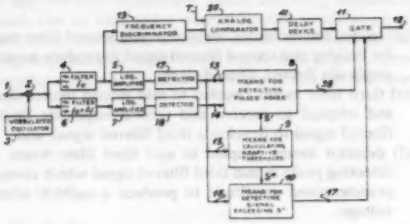
U.S. Cl. 455—223 **8 Claims**

1. Device for reducing the false alarm ratio for a radio-electric monitor receiver having a first output delivering a logic alarm signal when a signal is received on a monitored fre-

quency, and a second output delivering a value for the energy of the signal received, comprising

a logic gate having an input coupled to the first output of the monitor receiver, having a validation input, an inhibition input and an output forming the output of the device,

means for comparing the energy of the signal received by the monitor receiver with respect to a variable value S'', having a first input connected to the second output of the monitor receiver, a second input receiving the value S'', and an output supplying a logic signal to the validation input of the gate in order to validate the same when the signal received has a energy value higher than S'',



means for detecting a pulsed noise signal in a band centered on the frequency monitored and for comparing its energy with respect to a variable value S', having a first input connected to the second output of the monitor receiver and having a second input receiving the value S' and an output connected to the inhibition input of the gate, for inhibiting the same when a pulsed noise signal has an energy value exceeding S';

means connected to the second output of the monitor receiver for determining a value B for the energy of noise signals in a frequency band encompassing the frequency monitored and calculating the values S' and S'' as a function of B.

4,479,253

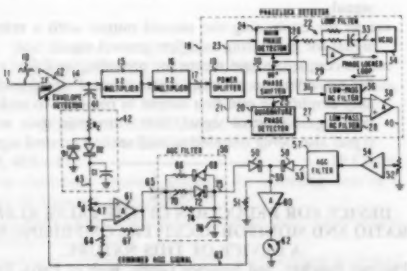
PHASELOCK RECEIVER WITH INPUT SIGNAL MEASURING CAPABILITY

James W. Daniel, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,453

Int. Cl.³ H04B *17/00, 1/16*

U.S. Cl. 455—226 **15 Claims**



1. In a communications receiver including means for extracting a carrier signal from a modulated radio frequency input signal and further including means responsive to said carrier signal for generating a control signal having a dc voltage level indicative of the strength of said carrier signal, wherein said extracting means includes nonlinear elements such that the strength of said carrier signal is not linearly related to the strength of said input signal, an apparatus for providing a measuring signal which is substantially linearly related to the strength of said input signal, said apparatus comprising:

detector means responsive to said input signal for providing a signal representative of the envelope of said input signal; and

means for combining said envelope detector signal and said control signal to produce said measuring signal.

4,479,254

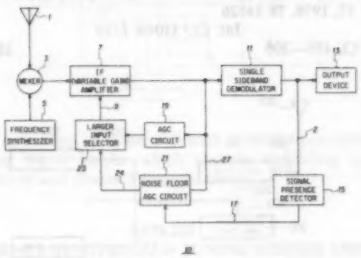
NOISE FLOOR AUTOMATIC GAIN CONTROL

Robert L. Craiglow, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,689

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—239 **6 Claims**



4. A method of providing noise floor automatic gain control for a radio receiver that receives a modulated signal and converts the modulated signal to a demodulated signal whose amplitude varies in response to a first automatic gain control signal controlling the gain of said radio receiver, comprising the steps of:

providing a second automatic gain control signal for controlling the gain of the radio receiver when the demodulated signal is present;

providing a third automatic gain control signal for controlling the gain of the radio receiver when the demodulated signal is absent; and

selecting the larger of the second control signal or the third control signal as said first automatic gain control signal.

4,479,255

APPARATUS FOR ACQUIRING AND COLLECTING RADIO SIGNALS COMING FROM A PLURALITY OF STATIONS

Michel Geesen, Antony; Jacques Mourant, Maurepas, and Daniel P. Ludwig, Ramonville-Saint-Agne, all of France, assignors to Electronique Marcel Dassault and Centre National d'Etudes Spatiales, both of Paris, France

Continuation-in-part of Ser. No. 38,748, May 14, 1979, , and a continuation-in-part of Ser. No. 166,621, Jul. 7, 1980, , which is a continuation-in-part of Ser. No. 38,770, May 14, 1979,. This application Nov. 5, 1981, Ser. No. 318,542

Claims priority, application France, May 16, 1978, 78 14339; May 17, 1978, 78 14626

Int. Cl.³ H04B *1/16, 17/00*

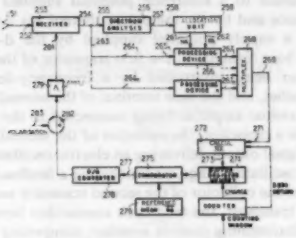
U.S. Cl. 455—246 **20 Claims**

1. Apparatus for acquiring messages transmitted by radio signal from a plurality of radio beacons and providing AGC control, comprising:

means for receiving radio signals from said beacons, said receiving means having an adjustable gain control;

means for detecting and processing said radio signals received by said receiving means, including means for producing at least an approximate indication of the level of each of said radio signals;

means for performing a statistical analysis of said level indications; and



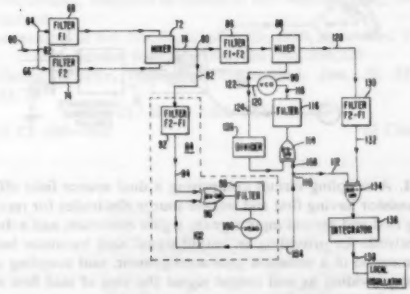
means for deriving from said statistical analysis a gain control signal to be applied to said receiving means to maintain the gain of said receiving means at a predetermined level over an extended period of time.

4,479,256

TWO PILOT FREQUENCY CONTROL FOR COMMUNICATION SYSTEMS

Ake N. Sewerinson, Port Coquitlam, Canada, assignor to AEL Microtel, Limited, Burnaby, Canada

Filed Oct. 4, 1982, Ser. No. 432,497
Int. Cl.³ H04B 1/16
U.S. Cl. 455—265 **10 Claims**



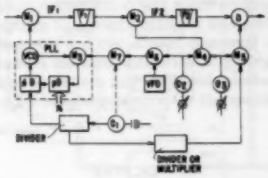
1. Apparatus for deriving a frequency control signal for controlling the frequency of a local oscillator at a remote station to compensate for a frequency error introduced during transmission to a pair of pilot signals of a first frequency and a second frequency transmitted from a reference station to said remote station, said first and second frequencies being shifted by said frequency error during transmission said apparatus comprising: a first and second filter means separating said pilot signals into first and second pilot signals; first means coupled to said first and second filter means for deriving from said first and second pilot signals a third signal having a frequency equal to the difference in frequency of said first and second pilot signals; second means for deriving from said pilot frequencies a fourth signal which includes said frequency error introduced during transmission; and, third means for deriving from said third and fourth signal said frequency control signal for adjusting said local oscillator frequency to compensate for said frequency error.

4,479,257

SUPERHETERODYNE CIRCUIT HAVING VARIABLE BANDWIDTH AND CENTER FREQUENCY SHIFT FUNCTION

Koji Akiyama, Tokyo, Japan, assignor to Yaesu Musen Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,652
Int. Cl.³ H04B 1/26
U.S. Cl. 455—266 **5 Claims**



1. A superheterodyne circuit comprising:

a first mixer converting a received signal into a first intermediate frequency; a second mixer converting the first intermediate frequency into a second intermediate frequency; a first intermediate frequency filter connected between said first and second mixers; a product detector having a BFO input for demodulating the second intermediate frequency to an audio frequency; and a second intermediate frequency filter connected between said second mixer and said product detector, wherein a VCO supplies a local oscillation frequency to the first mixer, while the oscillation frequency of the VCO is determined by a PLL circuit, wherein the VCO is responsive to a control voltage generated by a phase comparator responsive to a reference frequency input and said supplied local oscillation frequency which is processed by a third mixer and a programmable frequency divider in cascade, a first oscillator coupled to said phase comparator to supply said reference frequency, wherein a local oscillation frequency for the second mixer is an output obtained by mixing the frequency of an adjustable frequency second oscillator with that of an adjustable frequency third oscillator in a fourth mixer; a fifth mixer responsive to a frequency of the third oscillator and a frequency related to the frequency of the first oscillator; a sixth mixer responsive to said second oscillator and a variable frequency oscillator for providing a respective output signal; a seventh mixer for mixing said respective output signal with a frequency related to the frequency of the first oscillator to provide an input signal to said third mixer of the PLL circuit; the total effective intermediate frequency bandwidth of said first and second intermediate frequency filter and an effective intermediate frequency filter center frequency position being variable for a reception band determined by the relationship between a frequency-division ratio of the programmable frequency divider of the PLL circuit and a first oscillator related frequency input to the seventh mixer, the bandwidth and center frequency position being varied by initially tuning a received frequency determined by the frequency of the VFO, and, for bandwidth variation subsequently varying the frequency of the second or third oscillator or simultaneously varying the frequencies of the second and third oscillators in a first relationship, and, for center frequency position variation, subsequently, simultaneously varying the frequencies of the second and third oscillators in a second relationship.

4,479,258

CROSS-POLARIZATION CROSSTALK CANCELLER

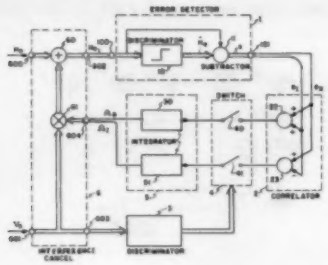
Junji Namiki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,112

Claims priority, application Japan, Sep. 30, 1981, 56-153970; Sep. 30, 1981, 56-153971

Int. Cl.³ H04B 1/12

U.S. Cl. 455—295 6 Claims



4. A crosstalk canceller for two cross-polarized orthogonal waves, each of said orthogonal waves having a real component and an imaginary component, said canceller comprising means for multiplying first signals received on one of said two orthogonal waves by a compensating coefficient, first means responsive to said multiplying means for adding the resulting product to second signals received on the other of said two orthogonal waves to produce a sum signal, error detector means responsive to the sum signal output of said adding means for providing an error signal equal to be difference between said sum signal and an value related to said sum signal, means responsive to said sum signal for providing said identified value, second adder means and subtractor means responsive to said error detector means for adding and subtracting real and imaginary components of the error signal, control means responsive to an equality of the absolute values of said real and imaginary components of said first signal for providing a control signal identifying the quadrant to which the first signal belongs, switching means responsive to the control signal for varying the signs of the outputs of said second adder means and said subtractor means, and low-pass filter means for smoothing the output of said switching means to provide said compensating coefficient.

4,479,259

TRANSISTOR OSCILLATOR CIRCUIT

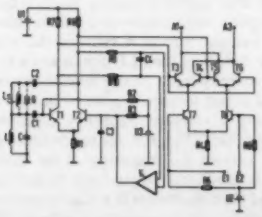
Josef Fenk, Eching/Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,629

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041392; Dec. 5, 1980, 3045993

Int. Cl.³ H04B 1/26; H03B 5/12

U.S. Cl. 455—318 11 Claims



1. Integrable oscillator circuit having a mixing stage driven by an external signal and an oscillating stage formed by a differential amplifier having a first and a second emitter-coupled transistor, both of the transistors being connected by the emitters thereof to a reference potential supplied by a d-c voltage source and by the collectors thereof via a respective resistor to a supply potential supplied by the d-c voltage source, the base terminal of the first transistor of the differential amplifier being controlled by a frequency-determining control member, and the base terminal of the second transistor of the differential amplifier being connected to the reference potential via a capacitor, the collector of the second transistor forming a signal output delivering an electric oscillation generated in the oscillating stage, and including a feedback connection between the collector of the second transistor and the base of the first transistor, the feed-back connection being via the frequency-determining control member, comprising a control amplifier having a plurality of inputs, the respective collector of the first and second transistors being connected to respective input terminals of the mixing stage as well as via a respective lowpass filter to the inputs, respectively, of said control amplifier, said control amplifier having an output fed back to the oscillating stage in the sense of a d-c-wise negative feedback connection so that the collector potentials of said first and second transistor as well as the potential at said input terminals of the mixing stage operate with minimal offset.

4,479,260

COUPLING AND MIXING CIRCUIT COMPRISING A DUAL SOURCE TRANSISTOR

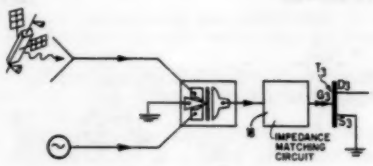
Peter Harrop, Yerres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,551

Claims priority, application France, Nov. 27, 1981, 81 22253

Int. Cl.³ H04B 1/26; H01L 29/76

U.S. Cl. 455—333 3 Claims



1. A coupling circuit comprising a dual source field effect transistor having first and second source electrodes for receiving first and second input signals, a gate electrode, and a drain electrode for providing an output signal, said transistor being connected in a common gate arrangement, said coupling circuit providing as said output signal the sum of said first and second input signals.

4,479,261

BATTERY SAVING CIRCUIT FOR PAGING RECEIVER

Takashi Oda, and Takeshi Nakajima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,180

Claims priority, application Japan, Apr. 19, 1982, 57-66021

Int. Cl.³ H04B 1/16, 5/04

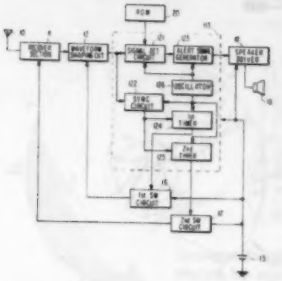
U.S. Cl. 455—343 10 Claims

10. A battery operated receiver including a receiving section and a waveform shaping section coupled to said receiving section for receiving a carrier modulated with a calling signal, said waveform shaping section requiring a predetermined time after the application of power to achieve operating status, a battery saving circuit comprising:

means for detecting said calling signal from said waveform shaping section and for producing a detection signal in response to said calling signal;

first timer means for producing a first switching signal in response to said detection signal;

second timer means for producing a second switching signal, delayed from said first switching signal by said predetermined time, in response to said detection signal;



means responsive to said first switching signal for applying power from said battery to said waveform shaping section; and

means responsive to said second switching signal for applying power from said battery to said receiving section.

4,479,262

STATIC AUDIO-FREQUENCY CONTROL RECEIVER

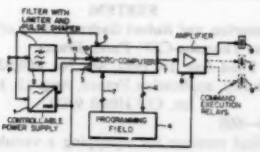
Ulrich Rudolf, Thalwil, and Martin Vetter, Oberageri, both of Switzerland, assignors to Landis & Gyr Aug AG, Zug, Switzerland

Continuation of Ser. No. 53,322, Jun. 29, 1979, abandoned. This application Mar. 16, 1982, Ser. No. 358,725

Claims priority, application Switzerland, Jun. 30, 1978, 7152/78

Int. Cl.³ H04B *1/06*; G01R *21/00*

U.S. Cl. 455—352 **11 Claims**



1. An audio-frequency control receiver programmable for use at a specific receiver location to receive incoming audio-frequency impulse patterns to select impulse patterns having the correct pattern for the specific receiver location comprising:

a micro-computer including a read only memory (ROM) having stored therein a plurality of predetermined impulse scanning patterns;

a filter circuit for receiving, and passing through, the incoming audio frequency impulse patterns;

said micro-computer being connected to said filter for comparing the incoming audio-frequency impulse patterns with a selected one of said predetermined impulse scanning patterns stored in said read only memory to determine whether any of the incoming audio-frequency impulse patterns match said selected predetermined impulse scanning pattern;

a programmable programming field connected to said micro-computer to select said selected predetermined impulse scanning pattern to be used at the specific receiver location for said comparing, and to specify a pattern-specific impulse sequence for comparison by said micro-computer with command control impulse sequences included within an incoming audio-frequency impulse pattern matching said selected predetermined impulse scanning pattern for the specific receiver location; and

an output circuit connected to said micro-computer activatable in response to a match between said patern-specific impulse sequence and one of said command control impulse sequences included within said incoming audio-frequency impulse pattern matching said selected predetermined impulse scanning pattern for the specific receiver location.

4,479,263

DEVICE FOR ACQUIRING AND PROCESSING ELECTRICAL SIGNALS

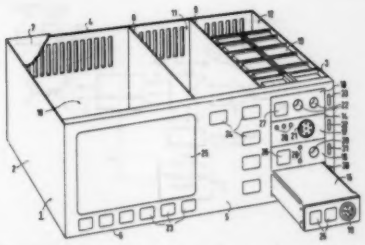
Bernd Rosenfeldt; Gerhard Weller; Arthur Wondra, and Edmund Reis, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 8, 1981, Ser. No. 262,213

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019668

Int. Cl.³ H04B *9/00*

U.S. Cl. 455—602 **21 Claims**



1. A device for acquiring and processing electrical signals, comprising a device housing with a signal processing part, at least one insert including an insert housing of insulation material and electrically conductive insert means carried thereby, said insert being insertable in said device housing as a signal transmission part, cooperating coupling elements for disposition in a cooperating relationship to define a galvanically separating coupling location therebetween and so as to provide for at least one of energy and signal transmission between said coupling elements via the galvanically separating coupling location therebetween without any galvanically conductive path between said coupling elements, one of said cooperating coupling elements being carried with said insert, an insulating body mounted at the interior of the device housing, said insulating body being of insulating material and having an interior space removably receiving the insert housing and having the other of the cooperating coupling elements mounted at said interior space such that with the insert in said interior space of said insulating body said one and said other of said cooperating coupling elements are disposed in said cooperating relationship, said insert when positioned in said interior space being electrically isolated against capacitive leakage current not only by the insulation material of the insert housing but additionally

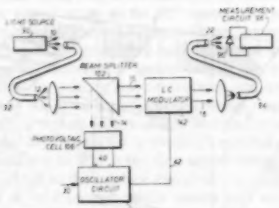
by the insulating material of said insulating body, characterized in that the insulating body is formed of two mating C-shaped insulating parts which, when connected together, form a box housing which is open at the front and back, and means comprising the insulating material of said insulating body for isolating said insert against capacitively coupled leakage current, said device housing having a signal processing part, characterized in that the box housing exhibits a respective insertion groove at two opposite edges at the back thereof, and an insulated back plate engageable in said insertion grooves for covering the open back of the box housing, said back plate being the carrier of one of the cooperating coupling elements and connecting the same with the device housing, said cooperating coupling elements providing for signal transmission between the signal transmission part of the insert and the signal processing part in said device housing.

4,479,264

TRANSDUCER FOR OPTICAL DATA TRANSMISSION

James F. Lockett, Missouri City; Jerry F. Janecka, Corpus Christi, and Thomas O. Mehrkam, Houston, all of Tex., assignors to Geosource Inc., Houston, Tex.

Filed Apr. 26, 1982, Ser. No. 371,951
Int. Cl.³ H04B 9/00
U.S. Cl. 455—605 **10 Claims**



1. A transducer adapted to receive an input optical signal and responsive to a predetermined parameter which is to be measured, for modulating a portion of said input optical signal in a dependence of said parameter, said transducer comprising:

first optical coupling means having a first end for receiving said input optical signal and a second end for transmitting said input optical signal;

separating means optically connected to said second end of said first optical coupling means for receiving said input optical signal and for separating said input optical signal into first and second optical signals;

conversion means for receiving said first optical signal and for generating an electrical power signal;

driver means powered by said electrical power signal and response to said predetermined parameter, for generating an electrical drive signal representative of said predetermined parameter;

modulation means connected to receive said electrical drive signal and said second optical signal, for modulating said second optical signal in dependence to said electrical drive signal to produce a modulated output optical signal; and

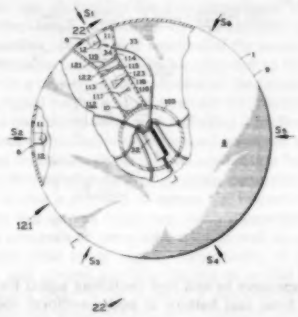
second optical coupling means having a first end for receiving said modulated output optical signal and a second end for transmitting said modulated output optical signal.

4,479,265

LASER MICROPHONE

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33305

Filed Nov. 26, 1982, Ser. No. 444,627
Int. Cl.³ H04B 9/00
U.S. Cl. 455—605 **23 Claims**



1. A microphone comprising:

a housing having a substantially vertical axis and having a substantially cylindrical outer wall defining a substantially cylindrical planar cavity, bounded by the outer wall and a top and a bottom plate, the outer wall having a plurality of apertures disposed equidistantly around the outer wall, and serving to admit incoming sound waves into the cavity;

laser generator means disposed inside the cavity for generating laser light waves in the cavity;

sound wave-responsive means for reflecting the laser light, consisting of at least one low mass, flexibly suspended light reflecting element exposed to the incoming sound waves and for frequency modulating the laser light in accordance with the sound waves, and

light-receiving means for receiving and operatively responding to the reflected frequency modulated light, disposed inside the cavity and serving for converting the laser light into electrical signals representing the incoming sound waves.

4,479,266

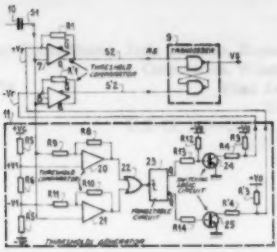
MULTIPLE-THRESHOLD OPTICAL RECEIVER FOR A VARIABLE-RATE DIGITAL DATA TRANSMISSION SYSTEM

Grégoire Eumurian, and Robert Gadrault, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 10, 1982, Ser. No. 406,936
Claims priority, application France, Aug. 12, 1981, 81 15599
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 **9 Claims**

1. An optical receiver for equipping a variable-rate digital data transmission system of the optical type in which information is transmitted in the form of light pulses coded in accordance with a code having a constant direct-current component, said optical receiver being constituted by a photodetector stage in series with a transimpedance circuit whose output is applied via a capacitor of a processing circuit to a first set of two threshold comparators having symmetrical threshold values, the outputs of said comparators being applied to a transcoding circuit, said processing circuit comprising said capacitor to eliminate the direct-current component and a threshold-generating circuit receiving the output signal of the capacitor and for generating said symmetrical threshold values which are variable as a function of said output signal level, said values being selected in said threshold-generating circuit from a plurality of distinct discrete values which are predetermined

so as to cover a large dynamic utilization range, said threshold-generating circuit including at least a second set of two threshold comparators to compare said output signal to symmetrical



constant threshold values, and a decision logic circuit controlled by said second set of comparators to select the said variable threshold values.

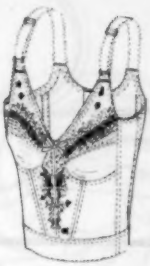
DESIGNS

OCTOBER 23, 1984

275,999
BRASSIERE
Jeanne M. Martini, Brooklyn, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,774
Term of patent 14 years
U.S. Cl. D2—24

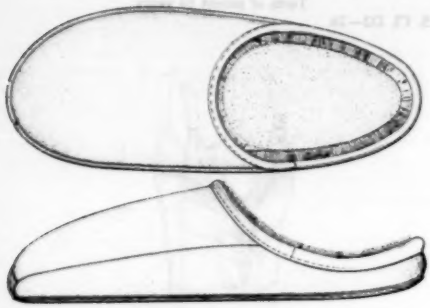
276,000
BRASSIERE
Jack Locascio, Bayonne, N.J., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,776
Term of patent 14 years
U.S. Cl. D2—24

276,001
BRASSIERE
Jack Locascio, Bayonne, N.J., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,844
Term of patent 14 years
U.S. Cl. D2—24



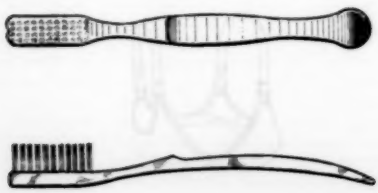
276,002
BRASSIERE
Flavia Di Tullio, New York, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jun. 7, 1982, Ser. No. 385,846
Term of patent 14 years
U.S. Cl. D2—24

276,003
SLIPPER
Robert McAbery, c/o Box 1937, Aspen, Colo. 81611
Filed May 24, 1982, Ser. No. 381,181
Term of patent 14 years
U.S. Cl. D2—308

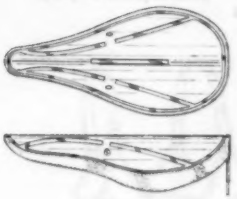


276,004
FOLDABLE JEWELRY HOLDER AND DISPLAY CASE
Jan B. Mink, 1783 Cable St., San Diego, Calif. 92107
Filed Sep. 8, 1981, Ser. No. 300,265
Term of patent 14 years
U.S. Cl. D3—75

276,005
TOOTHBRUSH
Stafan Fido, 5 Primrose St., Indian Orchard, Mass. 01151
Filed Feb. 22, 1982, Ser. No. 351,124
Term of patent 14 years
U.S. Cl. D4—104



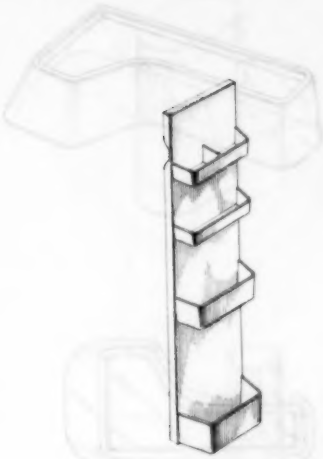
276,006
BICYCLE SEAT COVER
Robert D. Willis, Junction City, Oreg., assignor to Ride-On Enterprises, Inc., Eugene, Oreg.
Filed Mar. 26, 1982, Ser. No. 362,396
Term of patent 14 years
U.S. Cl. D6—502



276,007
ARMCHAIR WITH FOLDABLE ARMS
André Jarry, 10,140 Curotte St., Montreal, Quebec, Canada H2C 2Y6
Filed Jan. 29, 1982, Ser. No. 343,883
The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—368

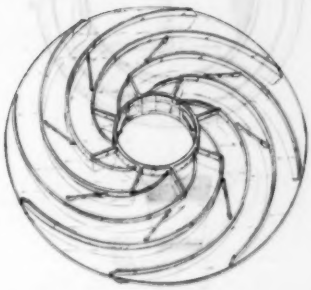
276,008
HANGER FOR A TUBULAR CONTAINER
Boyd G. Bottorff, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Feb. 18, 1982, Ser. No. 350,132
Term of patent 14 years
U.S. Cl. D6—513

276,009
LOCKER CADDY
Charles R. Ousley, P.O. Box 2304, Jackson, Tenn. 38301
Filed Dec. 6, 1982, Ser. No. 447,258
Term of patent 14 years
U.S. Cl. D6—570

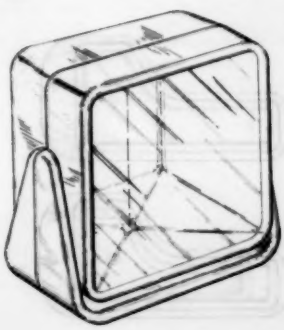


276,010
COFFEE TABLE
David R. Saltzman, 28686 Spring Arbor, Southfield, Mich. 48076
Filed Jul. 6, 1982, Ser. No. 395,460
Term of patent 14 years
U.S. Cl. D6—487

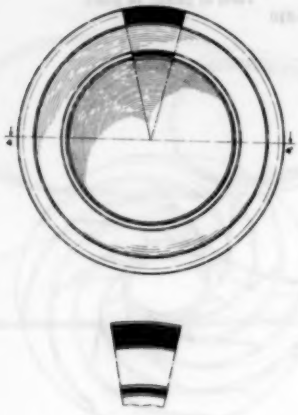
276,011
DISPLAY RACK MODULE
Wolf-Dietrich Hannecke, Rischenau Weg 6, 3410 Northeim, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 38,723, May 14, 1979, Pat. No. Des. 266,210. This application Feb. 1, 1982, Ser. No. 344,783
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1979, MR 47
Term of patent 14 years
U.S. Cl. D6—510



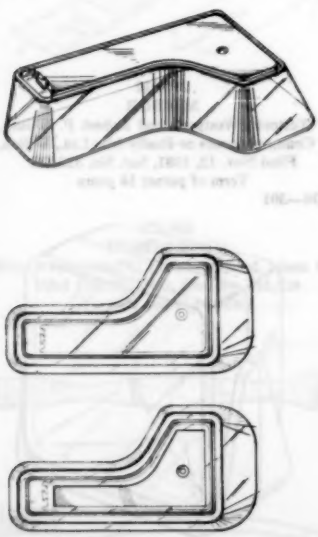
276,012
MIRROR
Edgar C. Westcott, Westport, and Robert P. Wilson, Wilton, both of Conn., assignors to Really Me. Ltd., Wilton, Conn.
Filed Nov. 12, 1981, Ser. No. 320,413
Term of patent 14 years
U.S. Cl. D6—301



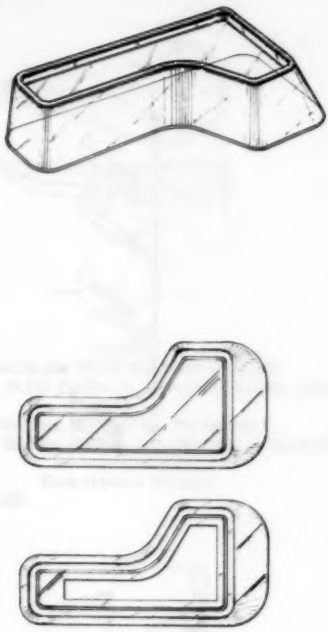
276,013
PLATE
Charles Solt, Stockton, N.J., assignor to Lenox, Incorporated, Lawrenceville, N.J.
Filed Dec. 3, 1981, Ser. No. 327,164
Term of patent 14 years
U.S. Cl. D7—36



276,014
FOOD TRAY COVER
Anthony C. Mack, North Reading, Mass., and David Shore, Atkinson, N.H., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Apr. 12, 1982, Ser. No. 367,402
Term of patent 14 years
U.S. Cl. D7—40



276,015
COMBINED EUTECTIC PACK AND FOOD TRAY COVER
Anthony C. Mack, North Reading, Mass., and David Shore, Atkinson, N.H., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Apr. 12, 1982, Ser. No. 367,403
Term of patent 14 years
U.S. Cl. D7—40



276,016

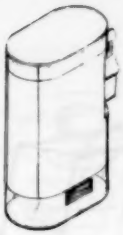
PEPPER MILL

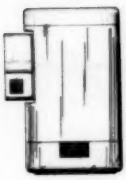
Kenneth M. Ferria, 66 Newtown La., East Hampton, N.Y. 11937

Filed Jul. 6, 1982, Ser. No. 395,688

Term of patent 14 years

U.S. Cl. D7—53





276,017

COMBINED SALT AND PEPPER SHAKER

Ronald E. Brewster, P.O. Box Drawer 498, Oneida, Tenn. 37841

Filed Jul. 19, 1982, Ser. No. 399,354

Term of patent 14 years

U.S. Cl. D7—57

276,018

COMBINED RACK, VEGETABLE PEELER, AND KNIFE

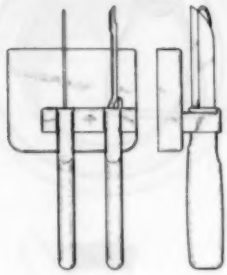
Leonhard Hagedorn, Niederneisen, and Rolf-Günter Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

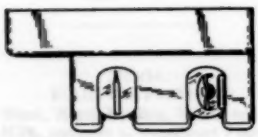
Filed Apr. 6, 1981, Ser. No. 251,566

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 6MR1061

Term of patent 14 years

U.S. Cl. D7—74





276,019

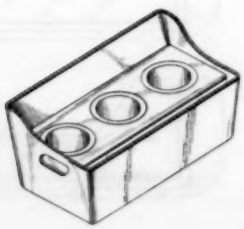
CARRYING TRAY FOR DINING TABLE SET-UP NEEDS

Evangelos Koustis, 27150 Lakeshore, Euclid, Ohio 44132

Filed Aug. 31, 1981, Ser. No. 297,939

Term of patent 14 years

U.S. Cl. D7—74



276,020

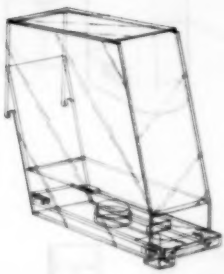
STORAGE AND DISPENSING CONTAINER

Vincent Battista, Elmhurst, Ill., assignor to Farley Candy Company, Skokie, Ill.

Filed Mar. 24, 1982, Ser. No. 361,132

Term of patent 14 years

U.S. Cl. D7—79



276,021

CARBONATING MACHINE FOR BEVERAGES

Kenneth G. Mabb, Peterborough, England, assignor to Sodastream Limited, Peterborough, England

Filed Jun. 25, 1980, Ser. No. 162,925

Claims priority, application United Kingdom, Jan. 14, 1980, 993146

Term of patent 14 years

U.S. Cl. D7—300

276,022

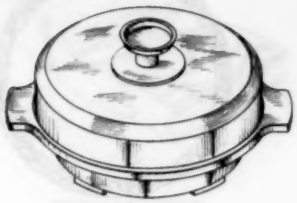
MICROWAVE EGG COOKER

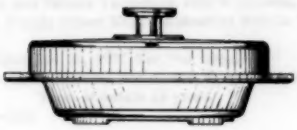
Robert F. Bowen, Burlington, and Thomas J. Martel, North Reading, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 7, 1982, Ser. No. 385,962

Term of patent 14 years

U.S. Cl. D7—360





276,023

BOTTLE CARRIER

Myron E. Ullman, Canfield, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio

Filed Feb. 8, 1982, Ser. No. 347,042

Term of patent 14 years

U.S. Cl. D9—344

276,024

PACKAGING CONTAINER

Roman L. Skowronski, Bay Village, and John M. Szekeres, Parma, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 12, 1981, Ser. No. 224,616

The portion of the term of this patent subsequent to Sep. 20, 1997, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—415

276,025

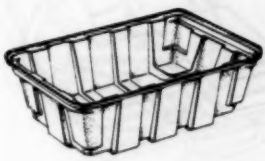
PACKAGING TRAY FOR FOOD OR THE LIKE

Don Hexamer, Brautford, Canada, assignor to Par-Pak Limited, Ontario, Canada

Filed Jun. 14, 1982, Ser. No. 388,370

Term of patent 14 years

U.S. Cl. D9—425



276,026

PACKAGING TRAY FOR FOOD OR THE LIKE

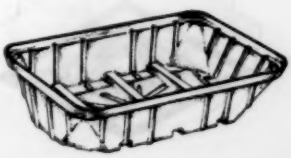
Don Hexamer, Brautford, Canada, assignor to Par-Pak Limited, Ontario, Canada

Filed Jun. 14, 1982, Ser. No. 388,578

Claims priority, application Canada, Apr. 1, 1982, 01-04-82-4

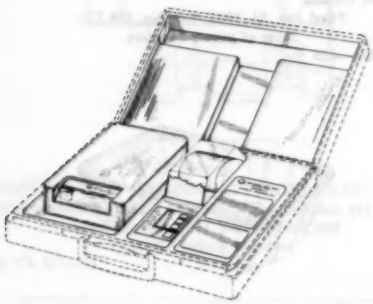
Term of patent 14 years

U.S. Cl. D9—425

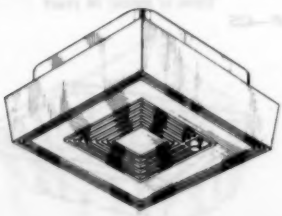


276,027
CONTAINER CAP
Fritz T. Albert, and Ernst F. W. Hellein, both of P.O. Box 7929, Philadelphia, Pa. 19101
Filed Dec. 11, 1981, Ser. No. 329,775
Claims priority, application United Kingdom, Jun. 19, 1981, 1001091
Term of patent 14 years
U.S. Cl. D9—452

276,028
LINE VOLTAGE MONITOR SYSTEM
Charles A. Crotty, Harwinton, Conn.; George L. Payne, Bedford Hills, N.Y., and Allen R. Perrins, Branford, Conn., assignors to The Superior Electric Company, Bristol, Conn.
Filed Apr. 21, 1981, Ser. No. 256,155
Term of patent 14 years
U.S. Cl. D10—75



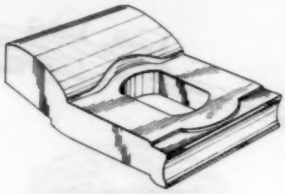
276,029
SMOKE DETECTOR
John S. Skarman, Newport Beach, Calif., assignor to Gateway Scientific, Inc., Costa Mesa, Calif.
Filed Jan. 25, 1982, Ser. No. 342,096
Term of patent 14 years
U.S. Cl. D10—106



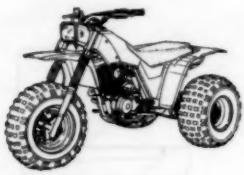
276,030
NECKLACE
Gianni Bulgari, Rome, Italy, assignor to Ditta SOTIRIO BULGARI di Costantino e Giorgio Bulgari S.a.s., Rome, Italy
Filed Feb. 5, 1982, Ser. No. 346,335
Claims priority, application Italy, Aug. 7, 1981, 35962-B81
Term of patent 14 years
U.S. Cl. D11—13

276,031
FIGURINE OF AN AFGHAN
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison and Company, Laguna Hills, Calif.
Filed Jun. 17, 1982, Ser. No. 389,544
Term of patent 14 years
U.S. Cl. D11—158

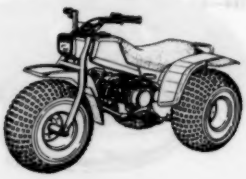
276,032
CRANE RAIL CLIP
James R. Lozelle, 13 Regent Dr., Ann Arbor, Mich. 48104, and William E. Lozelle, 1193 Sunningdale, Grosse Pointe Woods, Mich. 48236
Filed Dec. 28, 1981, Ser. No. 335,960
Term of patent 14 years
U.S. Cl. D12—51



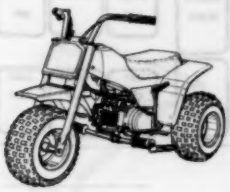
276,033
MOTOR TRICYCLE
Yasuhiro Ohba, and Mituru Yamamoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 26, 1982, Ser. No. 401,690
Claims priority, application Japan, Feb. 5, 1982, 57-4681
Term of patent 14 years
U.S. Cl. D12—110



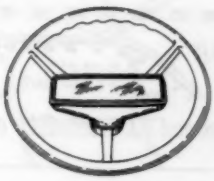
276,034
MOTOR TRICYCLE
Akio Makita, and Masahiro Watanabe, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 26, 1982, Ser. No. 401,776
Claims priority, application Japan, Feb. 5, 1982, 57-4680
Term of patent 14 years
U.S. Cl. D12—110



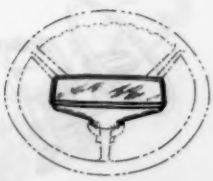
276,035
MOTOR TRICYCLE
Jun Ito, Tokyo, and Kazuhiko Yokoyama, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1982, Ser. No. 436,082
Claims priority, application Japan, Jun. 24, 1982, 57-28349
Term of patent 14 years
U.S. Cl. D12—110



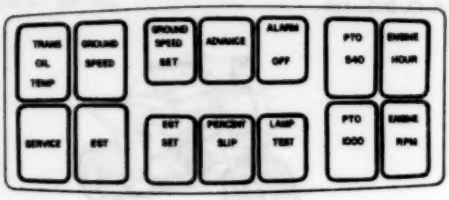
276,036
COMBINED VEHICLE STEERING WHEEL AND KEYBOARD HOUSING
Gregg C. Montgomery, Hinsdale, Ill., assignor to International Harvester Co., Chicago, Ill.
Filed Nov. 15, 1982, Ser. No. 441,696
Term of patent 14 years
U.S. Cl. D12—176



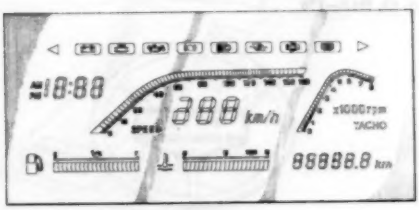
276,037
VEHICLE STEERING WHEEL KEYBOARD HOUSING
Gregg C. Montgomery, Hinsdale, Ill., assignor to International Harvester Co., Chicago, Ill.
Filed Nov. 15, 1982, Ser. No. 441,695
Term of patent 14 years
U.S. Cl. D12—177



276,038
FACE FOR VEHICLE STEERING WHEEL KEYBOARD
Gregg C. Montgomery, Hinsdale, Ill., assignor to International Harvester Co., Chicago, Ill.
Filed Nov. 15, 1982, Ser. No. 441,694
Term of patent 14 years
U.S. Cl. D12—177



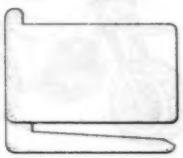
276,039
AUTOMOTIVE INSTRUMENT PANEL
Kiyoaki Tanaka, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan
Filed Apr. 6, 1982, Ser. No. 366,452
Claims priority, application Japan, Oct. 6, 1981, 56/44232
Term of patent 14 years
U.S. Cl. D12—192



276,040
VEHICLE OPERATOR'S STATION
Gregg C. Montgomery, Hinsdale, Ill., assignor to International Harvester Co., Chicago, Ill.
Filed Nov. 15, 1982, Ser. No. 441,699
Term of patent 14 years
U.S. Cl. D12—192

276,041
JET ROCKET SHIP
Daniel Reyes, Room 3615, 233 Broadway, New York, N.Y. 10007
Filed Jan. 14, 1980, Ser. No. 111,879
Term of patent 14 years
U.S. Cl. D12—343

276,042
CONNECTOR HOUSING
Yasuharu Morial, Suzuka; Yoshio Ito, Yokkaichi, and Atsushi Sakatani, Matsusaka, all of Japan, assignors to Tokai Electric Wire Co., Ltd., Yokkaichi, Japan
Filed Feb. 25, 1982, Ser. No. 352,459
Claims priority, application Japan, Aug. 31, 1981, 56-38419
Term of patent 14 years
U.S. Cl. D13—24



276,043
MICROPHONE STAND DETACHABLE TRAY OR THE LIKE
Marcel Fitzner, 1672 Cerro Gordo, and Vesta P. Pinnell, Jr., P.O. Box 2894, both of, Sante Fe, N. Mex. 87501
Continuation-in-part of Ser. No. 273,345, Jun. 15, 1981, Pat. No. Des. 272,532. This application Apr. 26, 1982, Ser. No. 371,934
Term of patent 14 years
U.S. Cl. D14—13

276,044

LOUDSPEAKER

Manabu Kawachi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 16, 1982, Ser. No. 379,689

Claims priority, application Japan, Nov. 19, 1981, 56-51484

Term of patent 14 years

U.S. Cl. D14—30

276,045

LOUDSPEAKER

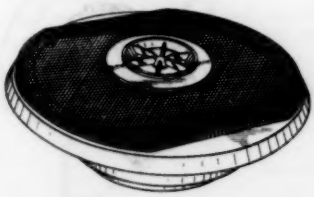
Manabu Kawachi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 17, 1982, Ser. No. 379,192

Claims priority, application Japan, Dec. 17, 1981, 56-55970; Dec. 17, 1981, 56-55971

Term of patent 14 years

U.S. Cl. D14—30



276,046

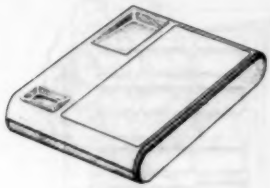
HOUSING FOR A TELEPHONE

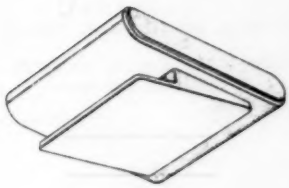
Donald M. Genaro, Haworth, N.J.; Jerome M. Gotway; Norris R. Hall, both of Indianapolis, Ind., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 5, 1983, Ser. No. 455,888

Term of patent 14 years

U.S. Cl. D14—60





276,047

MOWING MACHINE

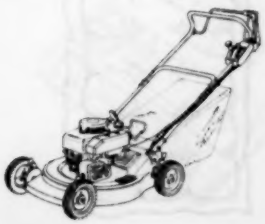
Kouichi Sasaki, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,841

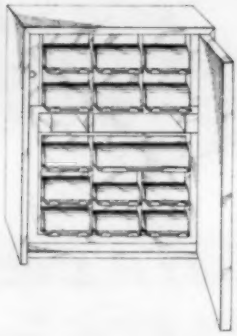
Claims priority, application Japan, Sep. 16, 1981, 56-40939

Term of patent 14 years

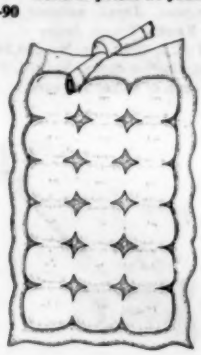
U.S. Cl. D15—14



276,048
REFRIGERATED CABINET FOR BEVERAGE CONTAINERS
Frank I. Harris, London, England, assignor to Minibar Limited, Middlesex, England
Filed Oct. 23, 1981, Ser. No. 314,306
Claims priority, application United Kingdom, Apr. 24, 1981, 1000213
Term of patent 14 years
U.S. Cl. D15—86

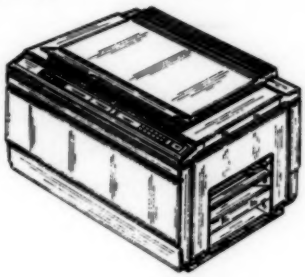


276,049
PACKAGE FOR FROZEN LIQUIDS
Jan Folkmar, Buddingevej 87B [1], 2800 Lyngby, Denmark
Filed Sep. 28, 1981, Ser. No. 306,620
Claims priority, application Denmark, Mar. 31, 1981, 406/81
Term of patent 14 years
U.S. Cl. D15—90



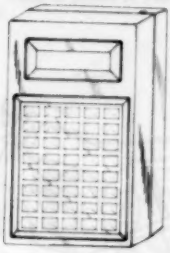
276,050
CAMERA
Koichi Soda, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jul. 26, 1982, Ser. No. 401,732
Claims priority, application Japan, Jan. 29, 1982, 57-3382
Term of patent 14 years
U.S. Cl. D16—1

276,051
ELECTRONIC COPYING MACHINE
Mikio Kosako, and Shigeaki Hayashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 10, 1982, Ser. No. 386,965
Term of patent 14 years
U.S. Cl. D16—31



276,052
PHOTOGRAPHIC PRINT PAPER MAGAZINE WITH MULTI-POSITION HANDLE
John A. Wedel, Mendota Heights; Larry M. Karjala, New Hope, and Gerald R. Bowe, Blaine, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.
Filed Mar. 22, 1982, Ser. No. 360,800
Term of patent 14 years
U.S. Cl. D16—33

276,053
INSURANCE CALCULATOR
William F. Boehle, 12921 Abrams #404, Dallas, Tex. 75243, and Michael J. Heiter, 624 Nottingham, Richardson, Tex. 75080
Filed Sep. 17, 1982, Ser. No. 419,180
Term of patent 14 years
U.S. Cl. D18—7

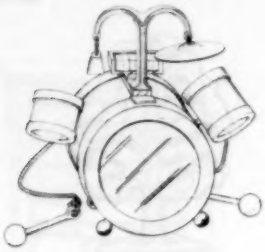


276,054
PARALYTIC COMMUNICATION BOARD
LaVal M. Pitts, 4260 N. 650 E., Provo, Utah 84601
Filed Jun. 4, 1982, Ser. No. 384,793
Term of patent 14 years
U.S. Cl. D19—59

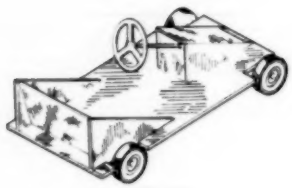
276,055
AMERICAN FAMILY TREE GAME PANEL OR SIMILAR ARTICLE
Joseph G. Guertin, 127 Benedict Rd., Pittsfield, Mass. 01201
Division of Ser. No. 267,513, Jun. 22, 1981, Pat. No. Des. 273,312. This application Jan. 18, 1984, Ser. No. 552,784
Term of patent 14 years
U.S. Cl. D21—25

276,056
ACTIVITY TOY OR THE LIKE
Yasusi Chatani, Tokorozawa, Japan, assignor to Kawada Co., Ltd., Tokyo, Japan
Filed Dec. 30, 1981, Ser. No. 335,946
Claims priority, application Japan, Sep. 11, 1981, 56-39956
Term of patent 14 years
U.S. Cl. D21—59

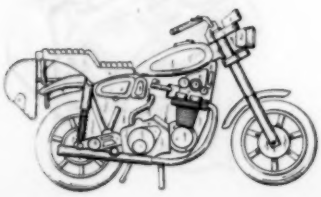
276,057
TOY DRUM SET
Herbert A. Plassmann, Bryan, Ohio, assignor to The Ohio Art Company, Bryan, Ohio
Filed Jan. 28, 1982, Ser. No. 343,758
Term of patent 14 years
U.S. Cl. D21—64



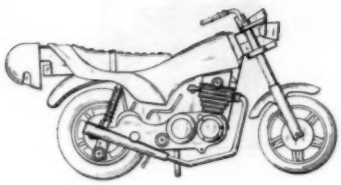
276,058
TOY COASTER
Garry W. C. Rogers, 402 Kirkfield St., Winnipeg, Manitoba, Canada
Filed Mar. 12, 1982, Ser. No. 357,827
Term of patent 14 years
U.S. Cl. D21—78



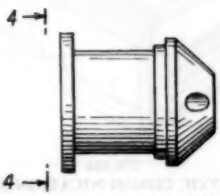
276,059
TOY MOTORCYCLE
Marvin Smollar, Northbrook; Keith Patterson, Oak Park, and Ronald Liedtke, Addison, all of Ill., assignors to Kidco, Inc., Bensenville, Ill.
Filed Jul. 13, 1982, Ser. No. 395,961
Term of patent 14 years
U.S. Cl. D21—134



276,060
TOY MOTORCYCLE
Marvin Smollar, Northbrook; Keith Patterson, Oak Park, and Ronald Liedtke, Addison, all of Ill., assignors to Kidco, Inc., Bensenville, Ill.
Filed Jul. 13, 1982, Ser. No. 395,962
Term of patent 14 years
U.S. Cl. D21—134



276,061
TOY VEHICLE HUB
Mel Mednick, New City, N.Y., assignor to L.J.N. Toys, Ltd., New York, N.Y.
Filed Mar. 29, 1982, Ser. No. 362,835
Term of patent 14 years
U.S. Cl. D21—141



276,062
BALANCE EXERCISER
Frank S. Dennis, Fort Worth, Tex., assignor to Molded Products Company, Fort Worth, Tex.
Filed Aug. 27, 1982, Ser. No. 412,129
Term of patent 14 years
U.S. Cl. D21—193

276,063

MOLDED BROOM HEAD FOR USE ON A BROOM BALL STICK

Conrad Gervais, Comté Laviolette, Canada, assignor to Le Balai Laviolette Enr., St-Tite, Canada

Filed Oct. 15, 1980, Ser. No. 197,190
Claims priority, application Canada, Jun. 3, 1980, 03-06-80-3
Term of patent 14 years
U.S. Cl. D21—210

276,064

HANDLE FOR A SANITARY FITTING

Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.

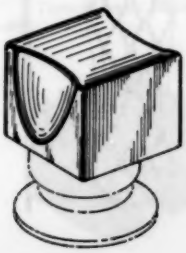
Filed Dec. 13, 1982, Ser. No. 449,018
Term of patent 14 years
U.S. Cl. D23—28

276,065

HANDLE FOR A SANITARY FITTING

Henry M. Stairs, Jr., Box-70D Blackpoint Rd., Neshanic, N.J. 08853

Filed Dec. 13, 1982, Ser. No. 449,019
Term of patent 14 years
U.S. Cl. D23—28

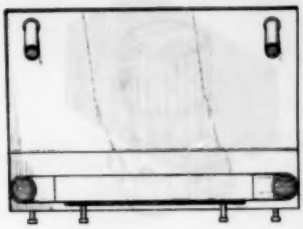


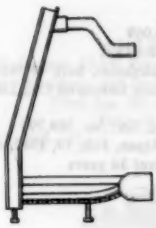
276,066

FIREPLACE HEATING APPLIANCE

Charles V. Emmendorfer, 11215 N. Elm Rd., Clio, Mich. 48420

Continuation-in-part of Ser. No. 60,178, Jul. 24, 1979,. This application Feb. 9, 1981, Ser. No. 232,686
Term of patent 14 years
U.S. Cl. D23—95





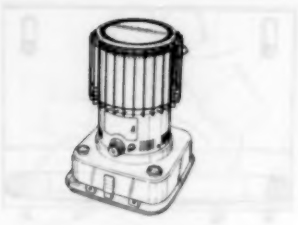
276,067

OIL HEATER

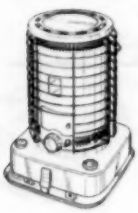
Daisaku Mori, Nara, and Seiichi Sakakibara, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 3, 1981, Ser. No. 289,643
Claims priority, application Japan, Feb. 12, 1981, 56-5315
Term of patent 14 years
U.S. Cl. D23—121

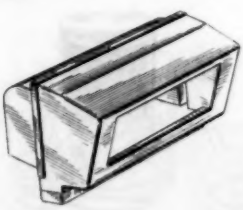
276,068
OIL HEATER
Daisaku Mori, and Youichi Takahashi, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,792
Claims priority, application Japan, Feb. 19, 1982, 57-7131
Term of patent 14 years
U.S. Cl. D23—121



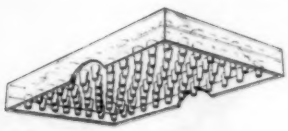
276,069
OIL HEATER
Daisaku Mori, and Youichi Takahashi, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,793
Claims priority, application Japan, Feb. 19, 1982, 57-7132
Term of patent 14 years
U.S. Cl. D23—121



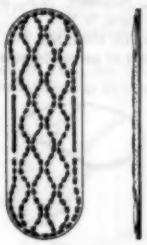
276,070
HOUSING FOR AN EVAPORATOR UNIT OF A SPLIT SYSTEM AIR CONDITIONER
William Giles, 9151 Central, Apt. "C", Garden Grove, Calif. 92643
Filed Feb. 2, 1982, Ser. No. 345,007
Term of patent 14 years
U.S. Cl. D23—141



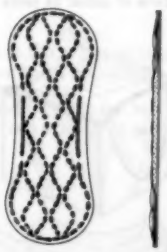
276,071
MEDICAL SAMPLER DEVICE
Don Malinoff, Granada Hills, Calif., assignor to Culture Tek Corporation, Granada Hills, Calif.
Filed Jun. 15, 1981, Ser. No. 273,472
Term of patent 14 years
U.S. Cl. D24—31



276,072
THIN ABSORBENT PAD
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 26, 1982, Ser. No. 371,908
Term of patent 14 years
U.S. Cl. D24—51



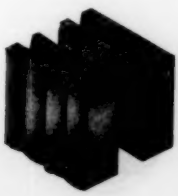
276,073
THIN ABSORBENT PAD
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 26, 1982, Ser. No. 371,910
Term of patent 14 years
U.S. Cl. D24—51



276,074
FOLDABLE SAWHORSE
Robert P. Wagster, Easton, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jun. 2, 1982, Ser. No. 384,251
Term of patent 14 years
U.S. Cl. D25—67

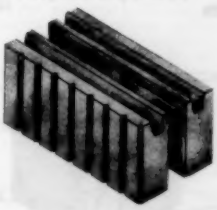
276,075
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,069
Term of patent 14 years
U.S. Cl. D25—89

276,076
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,448
Term of patent 14 years
U.S. Cl. D25—89

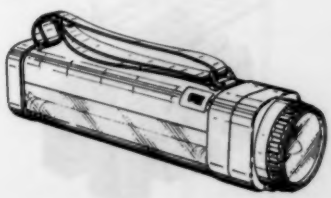


276,077
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,883
Term of patent 14 years
U.S. Cl. D25—91

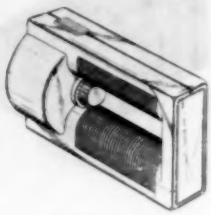
276,078
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,446
Term of patent 14 years
U.S. Cl. D25—91



276,079
MULTI-PURPOSE LANTERN
Lap-Kwan Cheng, Hong Kong, Hong Kong, assignor to Hang Ho Industrial Co. Limited, Kowloon, Hong Kong
Filed Apr. 5, 1982, Ser. No. 365,274
Claims priority, application United Kingdom, Oct. 7, 1981, 1002888
Term of patent 14 years
U.S. Cl. D26—42

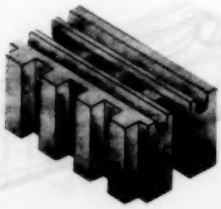


276,080
TORCH
Chi H. Kung, Kowloon, Hong Kong, assignor to Freezinhot Bottle Co., Ltd., Kowloon, Hong Kong
Filed Jan. 15, 1982, Ser. No. 339,633
Claims priority, application United Kingdom, Jul. 16, 1981, 81-1,001,513
Term of patent 14 years
U.S. Cl. D26—48

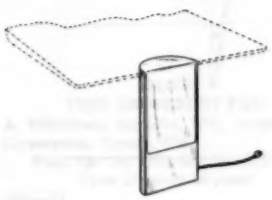


276,081
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 432,994
Term of patent 14 years
U.S. Cl. D25—89

276,082
BUILDING BLOCK
John N. Rassias, 33 SE. Fourth St., Boca Raton, Fla. 33432, and Cecily M. Clark, 565 Park Ave., New York, N.Y. 10021
Filed Sep. 29, 1982, Ser. No. 428,884
Term of patent 14 years
U.S. Cl. D25—91



276,083
DESK LAMP
Jan H. Matthias, Beverly Hills, Calif., assignor to Casa Bella Imports, Inc., Miami, Fla.
Filed Jan. 19, 1982, Ser. No. 340,876
Term of patent 14 years
U.S. Cl. D26—104

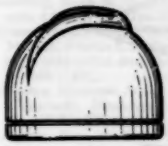


276,084
PULSATOR ATTACHMENT FOR A HAIR DRYER
Douglas G. Long, Lombard, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 13, 1981, Ser. No. 282,680
Term of patent 14 years
U.S. Cl. D28—18

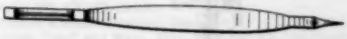
276,085
FIRELIGHTER
Kjell G. Östman, Jonkoping, Sweden, assignor to Intermatch S.A., Switzerland
Filed Dec. 31, 1981, Ser. No. 336,048
Claims priority, application Sweden, Jul. 7, 1981, 81-1533; Jul. 21, 1981, 81-1611
Term of patent 14 years
U.S. Cl. D27—30

276,086
CURLER/STYLER
Robert O. Ernest, Oak Park, and Douglas G. Long, Lombard, both of Ill., assignors to Sunbeam Corporation, Oak Brook, Ill.
Filed Jul. 12, 1982, Ser. No. 397,385
Term of patent 14 years
U.S. Cl. D28—35

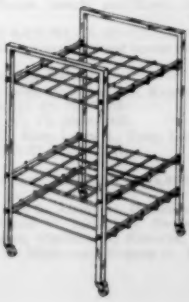
276,087
COSMETIC CONTAINER
Ben Kotyuk, Jr., East Northport, N.Y., assignor to Primary Development Group, New York, N.Y.
Filed Jan. 25, 1982, Ser. No. 342,619
Term of patent 14 years
U.S. Cl. D28—79



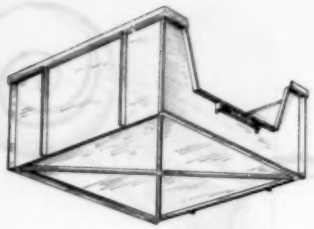
276,088
COMBINED DENTAL FLOSS HOLDER AND TOOTHPICK
Alex B. Y. Fong, 3613 Pahoa Ave., Honolulu, Hi. 96816
Filed Dec. 22, 1982, Ser. No. 435,893
Term of patent 14 years
U.S. Cl. D28—64



276,089
STORAGE RACK FOR ROLL PAPER PRODUCTS
John E. Hutchins, 249 S. Hwy. 101, Suite 365, Solana Beach, Calif. 92075
Filed Jan. 27, 1982, Ser. No. 343,063
Term of patent 14 years
U.S. Cl. D34—21

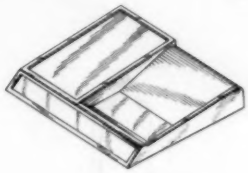


276,090
CONTAINER FOR CARRYING ARTICLES
David I. Gibson, Toronto, Canada, assignor to Nestier Canada, Inc., Ontario, Canada
Filed Nov. 16, 1979, Ser. No. 94,946
Term of patent 14 years
U.S. Cl. D34—43



276,091
CASKET TRIMMING
Francis R. Christian, River Forest, Ill., assignor to The Merit Company, Park Ridge, Ill.
Filed Aug. 2, 1982, Ser. No. 404,628
Term of patent 14 years
U.S. Cl. D99—8

276,092
COMBINED COIN TRAY AND MASSAGE DISPLAY DEVICE
Daniel W. Leo, New York, N.Y., assignor to Ledan, Inc., New York, N.Y.
Filed Jun. 24, 1982, Ser. No. 391,538
Term of patent 14 years
U.S. Cl. D99—34



276,093
SAVINGS BANK
Helge Ryvarden, Prestegardsveien 12, N-7000 Trondheim, Norway
Filed Apr. 6, 1981, Ser. No. 251,160
Claims priority, application Norway, Aug. 20, 1980, 61267
Term of patent 14 years
U.S. Cl. D99—35

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF OCTOBER, 1984

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaltonen, Olavi A.; Malmstrom, Rolf E.; Nermes, Esko O.; and Tuominen, Tapio K., to Outokumpu Oy. Apparatus for the separation of lead from a sulfidic concentrate. 4,478,394, Cl. 266-162.000.

Aarts, Petrus J. J.; Fleck, Harald; and Kocsisek, Karl, to U.S. Philips Corporation. Mounting for a head drum of a helical scan recorder. 4,479,157, Cl. 360-104.000.

AB Asea-Atom: *See*—
Andersson, Ingmar; Borrman, Bo; Fredin, Bo; and Nylund, Olov, 4,478,786, Cl. 376-444.000.

AB Casco: *See*—
Helgesson, Gote; Mansson, Bjorn; and Wallin, Nils-Hakan, 4,478,966, Cl. 524-13.000.

AB Statens Skogsindustrier: *See*—
Westling, Anders W., 4,478,891, Cl. 427-317.000.

AB Volvo Penta: *See*—
Brandt, Lennart; and Pichl, Heinz, 4,478,585, Cl. 440-112.000.

Abe, Akira, to Fuji Photo Film Co., Ltd. Method for measuring silver ion concentration in a solution. 4,478,943, Cl. 436-80.000.

Abolins, Visvaldis; Axelrod, Robert J.; and Shu, Peter H., to General Electric Company. Polyphenylene ether resin blends reinforced with finely divided particulate clay of narrow size distribution. 4,478,970, Cl. 524-125.000.

Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., to General Electric Company. Composition comprising copolymers of a vinyl aromatic compound and an unsaturated cyclic anhydride and impact improvers. 4,478,979, Cl. 525-68.000.

Abys, Joseph A., to AT&T Bell Laboratories. Silver plating procedure. 4,478,691, Cl. 204-43.00R.

Ackermann, Wilhelm; and Langlitz, Karlheinz, to Mannesmann Aktiengesellschaft. Tilt drive for metallurgical vessels. 4,478,102, Cl. 74-410.000.

Adachi, Takeshi; Takeshita, Tetsuo; and Matsuda, Itsuaki, to Showa Denko K.K. Method for treating electrolytic diaphragm. 4,478,680, Cl. 162-103.000.

Adachi, Tutomu: *See*—
Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, 4,478,995, Cl. 536-46.000.

Adair, Peter J.; Hobczuk, Michael P.; Kingsbury, Paul I.; and Nelson, John W., to Corning Glass Works. Embedding material useful in preparing glass-ceramic products. 4,478,641, Cl. 106-110.000.

Adams, John F. Collapsible carrier. 4,478,429, Cl. 280-655.000.

Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, to Novo Industri A/S. Method of treating plant polysaccharides. 4,478,854, Cl. 426-12.000.

Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, to Novo Industri A/S. Production of purified vegetable protein. 4,478,856, Cl. 426-46.000.

Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, to Novo Industri A/S. SPS, SPS-ase and method for producing SPS-ase. 4,478,939, Cl. 435-200.000.

Adolph Coors Company: *See*—
Thompson, Roger A., 4,478,336, Cl. 209-588.000.

Adrian, Klaus; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Liquid oxidative desizing agent and process for oxidative desizing. 4,478,737, Cl. 252-186.250.

AEL Microtel, Limited: *See*—
Sewerinson, Ake N., 4,479,256, Cl. 455-265.000.

Aeritalia-Societa Aerospaziale Italiana-per Azioni: *See*—
Capuani, Alfredo, 4,478,378, Cl. 244-12.500.

Aetna Bearing Company: *See*—
Dagiel, Richard T., 4,478,325, Cl. 192-98.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Bauer, Walter, 4,479,232, Cl. 378-187.000.

AGFA-Gevaert N.V.: *See*—
De Roo, Pierre R.; Gilliams, Yvan K.; and Van Gijsel, Francine, 4,478,923, Cl. 430-110.000.
Van Gossum, Lucien J.; Marien, August M.; De Winter, Walter F.; and Van Thillo, Etienne A., 4,478,907, Cl. 428-327.000.

Ahn, Hongsik, to Intertherm Inc. Furnace having water vapor-condensing secondary heat exchanger. 4,478,206, Cl. 126-99.00A.

Ainsworth, Anthony T.; and Smith, David G., to Beecham Group Limited. Secondary amines, their preparation and use in pharmaceutical compositions. 4,478,849, Cl. 424-285.000.

Air Products and Chemicals, Inc.: *See*—
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,478,959, Cl. 521-124.000.

Air Structures International, Inc.: *See*—
Fraioli, Donato M., 4,478,012, Cl. 52-2.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Akashi, Tohru; and Watanabe, Yutaka, 4,478,897, Cl. 428-31.000.
Hashimoto, Nobuyuki, 4,478,436, Cl. 285-137.00R.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Chattering preventive circuit. 4,479,065, Cl. 307-247.00R.

Ajinomoto Company Incorporated: *See*—
Ogino, Keizo; Takehara, Masahiro; Miyoshi, Takeshi; and Sagawa, Koichiro, 4,478,734, Cl. 252-117.000.

Akai, Shin-ichi, to Sumitomo Electric Industries, Inc. Method of producing GaAs single crystals doped with boron. 4,478,675, Cl. 156-605.000.

Akashi, Tohru; and Watanabe, Yutaka, to Aisin Seiki Kabushiki Kaisha. Compound molding. 4,478,897, Cl. 428-31.000.

Akerberg, Denis W., to QO Chemicals, Inc. Furan Resin coated aggregate. 4,478,269, Cl. 164-21.000.

Akisue, Osamu; Hatae, Seiryo; Toki, Hiroaki; Nakazawa, Kichi; and Wakako, Atsuhiro, to Nippon Steel Corporation. Method for producing a cold-rolled steel sheet having excellent formability. 4,478,649, Cl. 148-12.00C.

Akiyama, Hirshumi: *See*—
Tanouchi, Masatoshi; and Akiyama, Hirshumi, 4,478,723, Cl. 210-674.000.

Akiyama, Koji, to Yaesu Musen Co., Ltd. Superheterodyne circuit having variable bandwidth and center frequency shift function. 4,479,257, Cl. 455-266.000.

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Ohlsson, Johnny, 4,478,350, Cl. 220-436.000.

Alar Engineering Corporation: *See*—
White, Harold R.; and Doncer, Alex J., 4,477,939, Cl. 15-246.500.

Albanese, Andres, to AT&T Bell Laboratories. Conference circuit. 4,479,212, Cl. 370-62.000.

Alber, Franz. Fluid coupling for hollow rotary member. 4,478,247, Cl. 137-580.000.

Albert, Karmen D. Animal excrement removal device. 4,478,448, Cl. 294-1.0BA.

Alder-Nissen, Jens L.; Gurtler, Henrick; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, to Novo Industri A/S. Production of purified vegetable protein. 4,478,940, Cl. 435-209.000.

Alexander, Robert P.; Pichia, Robert J.; and Dauksch, Stephen F., to Motorola, Inc. P.C. Board mounting method for surface mounted components. 4,477,970, Cl. 29-837.000.

Alexeff, Igor: *See*—
Bailey, J. Milton; Alexeff, Igor; and Kreidl, Werner H., 4,479,103, Cl. 335-229.000.

Alfa-Laval AB: *See*—
Andersson, Kjell, 4,478,156, Cl. 108-53.100.

Alfranseder, Josef: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,478,948, Cl. 502-25.000.

Alkor GmbH Kunststoffverkauf: *See*—
Landler, Josef; and Mayr, Max, 4,478,660, Cl. 156-78.000.

Allen, Ernest R. Door jamb leveler. 4,478,016, Cl. 52-126.100.

Allen, Robert J., to Prototech Company. Ionizable reducing and oxidizing gaseous supply means and process for catalytic barriers and electrodes. 4,478,696, Cl. 204-105.00R.

Allied Corporation: *See*—
Fanelli, Anthony J.; and Price, Alson K., 4,478,987, Cl. 526-97.000.

Allor, Douglas R. Three dimensional electrocardiograph. 4,478,223, Cl. 128-699.000.

Almeida, Ronald P.: *See*—
Waite, Robert J.; and Almeida, Ronald P., 4,478,469, Cl. 339-17.0LC.

Almenara, Manuel A., to Medichem, S.A. Process for the preparation of 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxides. 4,478,996, Cl. 544-49.000.

Alps Electric Co., Ltd.: *See*—
Shimizu, Yutaka; Imura, Junichi; and Henmi, Shoichi, 4,479,106, Cl. 338-160.000.
Yoshisato, Akiyuki, 4,479,091, Cl. 329-122.000.

Althouse, John E. Standing wave ratio and power meter. 4,479,087, Cl. 324-58.00B.

Aluminum Company of America: *See*—
Christini, Roy A.; Rollies, Rolf; Bowman, Kenneth A.; and Ballain, Marlyn D., 4,478,637, Cl. 75-67.00R.
Ray, Siba P., 4,478,693, Cl. 204-64.00R.
Schoener, Ronald C.; King, Larry K.; Knap, Lester L.; and Kloap, Nicholas, 4,478,600, Cl. 23-313.0FB.

Alza Corporation: *See*—
Sheil, John W.; and Gale, Robert M., 4,478,818, Cl. 424-14.000.

Alzhanov, Tleubai M.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valen-

tina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.
Amano, Yoshikazu: *See*—
Katsuyama, Harumi; Amano, Yoshikazu; and Kondo, Asaji, 4,478,942, Cl. 436-66.000.
AMAX Inc.: *See*—
Graves, William L., 4,479,037, Cl. 191-36.000.
Amberson, Paul E., to National Steel Corporation. Method of and apparatus for hot dip coating of steel strip. 4,478,892, Cl. 427-320.000.
Amerace Corporation: *See*—
Pricone, Robert M.; and Montalbano, Anthony J., 4,478,769, Cl. 264-1.600.
American Can Company: *See*—
O'Sullivan, Eileen F., 4,478,663, Cl. 156-203.000.
American Cyanamid Company: *See*—
Huang, Sun Y.; and Giglia, Robert D., 4,478,991, Cl. 526-287.000.
American Hoist & Derrick Company: *See*—
Delago, Pierre C., 4,478,340, Cl. 212-253.000.
American Optical Corporation: *See*—
Masso, Jon D.; Brennan, William D.; and Rotenberg, Don H., 4,478,873, Cl. 427-40.000.
Amermac Inc.: *See*—
Greene, Aubrey E., 4,478,081, Cl. 73-487.000.
Ammann, Ernst, to ETA S.A., Fabriques d'Ebauches. Device for rotationally driving a member intermittently. 4,478,522, Cl. 368-37.000.
AMP Incorporated: *See*—
Cherry, Hitesh; and Werner, Walter M., 4,478,479, Cl. 339-273.00R.
Fruchard, Charles; and Joly, Jean C., 4,478,470, Cl. 339-74.00R.
Lockard, Joseph L., 4,478,588, Cl. 445-22.000.
Look, Raymond J., 4,478,778, Cl. 264-146.000.
Olsson, Billy E., 4,478,471, Cl. 339-74.00R.
Amundson, Arlon J.; and Wurscher, Robert J., to Micro Component Technology, Inc. Integrated circuit component handler singulation apparatus. 4,478,352, Cl. 221-13.000.
Anderson Company of Indiana, The: *See*—
Will, Terry M., 4,477,940, Cl. 15-250.350.
Anderson, Jeffrey J. Force multiplying archery bow. 4,478,202, Cl. 124-23.00R.
Anderson, Jeffrey J. Safety harness for hunters. 4,478,311, Cl. 182-3.000.
Andersson, Gustaf A.: *See*—
Svensson, Sten-Eric; and Andersson, Gustaf A., 4,478,141, Cl. 99-476.000.
Andersson, Ingmar; Borrman, Bo; Fredin, Bo; and Nylund, Olov, to AB Asea-Atom. Fuel assembly. 4,478,786, Cl. 376-444.000.
Andersson, Karl-Hugo; and Zinn, Nils, to Flakt Aktiebolag. Method of ventilating cylinder pockets in a cylinder dryer and apparatus for carrying out the method. 4,477,983, Cl. 34-114.000.
Andersson, Kjell, to Alfa-Laval AB. Nestable load carrier. 4,478,156, Cl. 108-53.100.
Ando, Makoto, to Minolta Camera Kabushiki Kaisha. Optical device with bayonet mount and position restriction means. 4,478,492, Cl. 350-257.000.
Ando, Yujiro: *See*—
Fujii, Haruo; and Ando, Yujiro, 4,478,510, Cl. 355-15.000.
Andoh, Masanao: *See*—
Saito, Hidefumi; Hayashi, Munehiro; Mitani, Hisashi; Isaka, Hiromu; and Andoh, Masanao, 4,478,046, Cl. 62-6.000.
Andrae, Klaus: *See*—
Heyse, Klaus; and Andrae, Klaus, 4,478,670, Cl. 156-380.100.
Andre, Guy: *See*—
Pittion, Philippe; Andre, Guy; Souillard, Gerald; J'espere, Jean-Louis; and Houte, Bernard, 4,478,381, Cl. 248-71.000.
Andreae, Karl: *See*—
Ilmer, Andreas; and Andreae, Karl, 4,479,150, Cl. 358-310.000.
Andree, James: *See*—
Madsen, Craig C.; Stewart, Daniel B.; and Andree, James, 4,479,111, Cl. 340-365.00P.
Andrei-Alexandru, Marcel; and Prohaska, Hans, to ITT Industries, Inc. Window lifter and door locking device. 4,478,004, Cl. 49-72.000.
Andrews Paper & Chemical Co., Inc.: *See*—
Muller, Peter; and Mustacchi, Henry, 4,478,926, Cl. 430-178.000.
Andrione, Norbert; and Bandoli, Fulvio, to Aspera S.p.A. Compressor with ducted crankshaft having a grooved end for oil distribution. 4,478,559, Cl. 417-368.000.
Angus Chemical Company: *See*—
Hunsucker, Jerry H., 4,478,597, Cl. 8-181.000.
Aoki, Akira: *See*—
Yano, Nobuyuki; Kotera, Takuro; Aoki, Akira; and Utagawa, Toshio, 4,478,053, Cl. 62-262.000.
Aoki, Harumi: *See*—
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, 4,479,062, Cl. 250-578.000.
Aoki, Shinichi: *See*—
Harigai, Akinori; Aoki, Shinichi; and Nakayama, Takehisa, 4,477,999, Cl. 446-470.000.
Aoki, Tadamichi: *See*—
Ayusawa, Tadashi; Aoki, Tadamichi; and Nomura, Yutaka, 4,479,017, Cl. 568-613.000.
Aoki, Takashi: *See*—
Miyoshi, Hideo; Umeda, Tadashi; and Aoki, Takashi, 4,478,507, Cl. 355-3.00R.
Aono, Toshiaki: *See*—
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; and Sato, Kozo, 4,478,927, Cl. 430-203.000.
Aoyagi, Hiroshi: *See*—
Takagi, Norio; and Aoyagi, Hiroshi, 4,478,772, Cl. 264-22.000.
Applebaum, Albert; Will, Albert S.; Humphrey, Samuel A.; McLean, Frank C.; Wolf, Sylvan; Peterson, Carl R.; Gauzza, Harry J.; and Hetzler, John C., to United States of America, Navy. Missile delivered explosive sound system. 4,478,148, Cl. 102-390.000.
APX Group, Inc.: *See*—
Harter, Donald P., 4,478,310, Cl. 181-241.000.
Arakawa, Hideki: *See*—
Higuchi, Mitsuo; and Arakawa, Hideki, 4,479,126, Cl. 340-825.860.
Arena, Aldo. Wrench with overcenter linkage. 4,478,114, Cl. 81-363.000.
Arends, Andrew G.; and Arends, Gary W. Compressed air filtering apparatus. 4,478,619, Cl. 55-316.000.
Arends, Gary W.: *See*—
Arends, Andrew G.; and Arends, Gary W., 4,478,619, Cl. 55-316.000.
Ares, Roland A.: *See*—
DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., 4,478,050, Cl. 62-193.000.
Ariss, Stephen A.; Measures, John C.; and Barker, David, to Mars Limited. Frozen food product and process for preparing. 4,478,868, Cl. 426-641.000.
Arkles, Barry C., to Petrarch Systems Inc. Mixtures of polyacrylate resins and siloxane carbonate copolymers. 4,478,981, Cl. 525-92.000.
Arla, Ekonomisk Forening: *See*—
Dahlen, Anne-Marie; and Strinning, Olof B. S., 4,478,855, Cl. 426-41.000.
Armco Inc.: *See*—
Littmann, Martin F., 4,478,653, Cl. 148-111.000.
Armour Pharmaceutical Company: *See*—
Bloom, James W., 4,478,825, Cl. 424-101.000.
Landaburu, Ricardo H.; Yue, Robert H.; Farb, David L.; and Violand, Bernard N., 4,478,829, Cl. 424-177.000.
Armstrong World Industries, Inc.: *See*—
Oren, Jess W., III, 4,478,092, Cl. 73-862.550.
Arnaud, Elmer J.: *See*—
Stelly, Curtis; and Arnaud, Elmer J., 4,478,549, Cl. 414-537.000.
Arnaudeau, Marcel, to Institut Francais du Petrole. Device for separating immiscible fluids of different specific gravities. 4,478,712, Cl. 210-96.100.
Arnold, David H.: *See*—
Rukavina, Daniel M.; and Arnold, David H., 4,478,009, Cl. 51-165.800.
Arnold, Jack A., to Stanley Aviation Corporation. Redundant seal ring coupling assembly. 4,478,439, Cl. 285-340.000.
Arns, James A.: *See*—
Wreede, John E.; and Arns, James A., 4,478,490, Cl. 350-162.110.
Aro Corporation, The: *See*—
Clifford, Earl W.; Perhach, John M.; and Sorce, Peter S., 4,478,070, Cl. 73-49.300.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Tanouchi, Masatoshi; and Akiyama, Hirshumi, 4,478,723, Cl. 210-674.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, 4,479,062, Cl. 250-578.000.
Suzuki, Shinichi, 4,479,052, Cl. 250-214.00R.
Asano, Sheiji, to Fuji Photo Optical Co., Ltd. Adapter for coupling a camera with an endoscope. 4,478,212, Cl. 128-6.000.
Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Karman's vortex street flow meter. 4,478,087, Cl. 73-861.220.
ASEA AB: *See*—
Nilsson, Jan, 4,478,789, Cl. 419-49.000.
ASEA Aktiebolag: *See*—
Hanas, Bertil, 4,478,273, Cl. 164-468.000.
Ashikaga, koichi: *See*—
Uchida, Seiya; and Ashikaga, koichi, 4,479,085, Cl. 323-280.000.
Ashland Oil, Inc.: *See*—
Bruylants, Philippe M.; and Garten, Robert L., 4,479,024, Cl. 585-437.000.
Asik, Joseph R., to Ford Motor Company. Enhanced spark energy distributorless ignition system (A). 4,478,201, Cl. 123-620.000.
Aspera S.p.A.: *See*—
Andrione, Norbert; and Bandoli, Fulvio, 4,478,559, Cl. 417-368.000.
Astech, Inc.: *See*—
Brown, William M.; and Dunn, Robert T., 4,479,033, Cl. 179-2.510.
Asulab S.A.: *See*—
Cognard, Jacques; and Basturk, Abdurrahman N., 4,478,739, Cl. 252-299.100.
AT&T Bell Laboratories: *See*—
Abys, Joseph A., 4,478,691, Cl. 204-43.00R.
Albanese, Andres, 4,479,212, Cl. 370-62.000.
Bagley, Brian G., 4,478,488, Cl. 350-96.230.
Bass, Ann H.; Blaschak, Jeffery G.; Marouf, Mohamed A.; Vancil, Paul W.; and Winchell, David F., 4,479,211, Cl. 370-62.000.
Benjamin, James M., 4,478,103, Cl. 74-425.000.
Chin, Aland K.; and Dutt, Bulusu V., 4,477,964, Cl. 29-572.000.
Embree, Milton L., 4,479,066, Cl. 307-350.000.
Falconer, David D., 4,479,092, Cl. 329-145.000.
Ferrer, Richard S.; Goldstein, Alan J.; and Nazif, Zaher A., 4,479,196, Cl. 364-900.000.
Herr, Diane E.; Metz, Reinhard; and Russell, Larry A., 4,479,195, Cl. 364-900.000.
Holzhauer, Norman H., 4,479,115, Cl. 340-611.000.

Krambeck, Robert H.; and Shoji, Masakazu, 4,479,216, Cl. 371-61.000.
Prabhu, Vasant K.; and Steele, Raymond, 4,479,226, Cl. 375-1.000.
Redman, Brian E.; and Woods, Gordon D., 4,479,122, Cl. 340-825.060.

AT&T Technologies, Inc.: *See*—
Zado, Frank M., 4,478,650, Cl. 148-23.000.

Atchison, Topeka and Santa Fe Railway Company: *See*—
Cena, Lawrence; and Mason, Ted D., 4,478,155, Cl. 105-355.000.

Atencio, Leroy G.: *See*—
Morris, Christopher L.; Idzorek, George C.; and Atencio, Leroy G., 4,479,059, Cl. 250-385.000.

Atobe, Masaaki, to Nippon Electric Co., Ltd. Multiple phase modulator for N sets of digital data. 4,479,099, Cl. 332-10.000.

Atochem: *See*—
Dessaint, Andre L.; and Lina, Marie-Jose , 4,478,975, Cl. 524-871.000.

Atwell, Graham J.: *See*—
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,479,000, Cl. 546-23.000.

Audiau, Francois; and Le Fur, Gerard R., to Pharmuka Laboratoires. 3-[2-(Tetra- and Hexa- hydro-4-pyridyl)-ethyl]-indoles and their use as medicaments. 4,478,841, Cl. 424-263.000.

Auer, Hugo, to Robert Bosch GmbH. Apparatus for filling portions of loose material into packaging containers. 4,478,262, Cl. 141-114.000.

Aurian-Blajeni, Benedict: *See*—
Halmann, Martin M.; Ulman, Mira; and Aurian-Blajeni, Benedict, 4,478,699, Cl. 204-158.00R.

Ausnit, Steven. Easy opening bag. 4,479,244, Cl. 383-63.000.

Autotype International Limited: *See*—
Sperry, John A.; and Maguire, Dennis D., 4,478,977, Cl. 525-61.000.

Auzet, Christian; Rusch, Daniel; and Chabernaud, Daniel, to Lignes Telegraphiques & Telephoniques. Process and apparatus for the synchronization on reception of a signal provided with a synchronization pattern. 4,479,230, Cl. 375-108.000.

Avar, Geza: *See*—
Schonfelder, Manfred; Haas, Peter; Avar, Geza; and Steinberger, Helmut, 4,478,893, Cl. 427-387.000.

Avibank Mfg., Inc.: *See*—
Duran, John A., 4,478,446, Cl. 292-341.180.

Aviles, Henry E.; Gregory, Jane A.; Panissidi, Hugo A.; and Wattenbarger, Henry E., to International Business Machines Corporation. Tri-axial force transducer for a manipulator gripper. 4,478,089, Cl. 73-862.040.

Axelrod, Robert J.: *See*—
Abolins, Visvaldis; Axelrod, Robert J.; and Shu, Peter H., 4,478,970, Cl. 524-125.000.

Ayusawa, Tadashi; Aoki, Tadamichi; and Nomura, Yutaka, to Mitsubishi Petrochemical Co., Ltd. Process for producing ether compounds by catalytic hydrogenolysis. 4,479,017, Cl. 568-613.000.

Azuma, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Dimension measuring apparatus. 4,477,978, Cl. 33-180.0AT.

Azuma, Masaaki: *See*—
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,478,982, Cl. 525-316.000.

Azuma, Toru; Hazama, Junji; Kawahara, Atsushi; Hada, Kazunari; and Fujii, Norio, to Nippon Kogaku K.K. Apparatus for detecting the defect of pattern. 4,479,145, Cl. 358-106.000.

B. F. Goodrich Company, The: *See*—
Conrady, James A., 4,478,972, Cl. 524-388.000.
McGarry, Frederick J., 4,478,963, Cl. 523-205.000.

Baar, Louis S., to RCA Corporation. Electrical connector. 4,478,472, Cl. 339-75.00M.

Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Overload-responsive clutch apparatus for selective connection of two drive shafts to a single driven shaft. 4,478,320, Cl. 192-48.910.

Babcock & Wilcox Company, The: *See*—
Broadwater, Robert P., 4,478,783, Cl. 376-211.000.

Backer, Stanley. Twisting method and apparatus. 4,478,037, Cl. 57-284.000.

Backstein, Gunter; Unger, Hans W.; Gunther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, to Rheinmetall GmbH. Underwater detonating device. 4,478,149, Cl. 102-426.000.

Bacon, Paul A.: *See*—
Blake, Colin C.; Goodall, Charles C. O.; and Bacon, Paul A., 4,478,714, Cl. 210-136.000.

Bafico, Michael A.: *See*—
Rogers, James E.; Warniak, James S.; Hobrock, Lowell M.; Bafico, Michael A.; and Scheele, Stephen R., 4,479,131, Cl. 343-872.000.

Bagdy, Daniel: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, 4,478,745, Cl. 260-112.50R.

Bagley, Brian G., to AT&T Bell Laboratories. Information transmission using dispersive optical fibers. 4,478,488, Cl. 350-96.230.

Baguley, Bruce C.: *See*—
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,479,000, Cl. 546-23.000.

Bailey, David G.: *See*—
Hopkins, William J.; Sweeney, Paula C.; and Bailey, David G., 4,478,728, Cl. 252-8.570.

Bailey, J. Milton; Alexeff, Igor; and Kreidl, Werner H., to Motor Magnetics. Polarized electromagnetic device. 4,479,103, Cl. 335-229.000.

Bailey, Wilber H., to Camino Laboratories, Inc. Artifact detector for heartbeat rate measuring system. 4,478,224, Cl. 128-706.000.

Baird, James C.; Japikse, Cornelis H.; and Kunsin, Richard F., to Procter & Gamble Company, The. Instant coffee containing packet and method of forming. 4,478,858, Cl. 426-126.000.

Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, to Richter Gedeon Vegyeszeti Gyar R.T. T-Butyloxy-carbonyl-D-phenylalanyl-L-prolyl-L-arginine aldehyde hemisulfate, D-phenylalanyl-L-prolyl-L-arginine aldehyde sulfate and process for the preparation thereof. 4,478,745, Cl. 260-112.50R.

Baker International Corporation: *See*—
Bowyer, Michael L., 4,478,288, Cl. 166-372.000.

Baker, Lewin T., to General Electric Company. Power-line carrier communications system with interference avoidance capability. 4,479,215, Cl. 371-33.000.

Baker Oil Tools, Inc.: *See*—
Fineberg, Douglas H., 4,478,286, Cl. 166-324.000.

Baldwin, Dan D., to Nautilus Sports/Medical Industries, Inc. Apparatus and method for exercising the abductor or adductor muscles. 4,478,411, Cl. 272-118.000.

Ball Corporation: *See*—
Wood, Charles L.; Mapes, Glenn H.; and Daudt, Stephen W., 4,478,629, Cl. 65-163.000.

Ball, William J.; Palmer, Keith W.; and Stewart, David G., to British Petroleum Company Limited, The. Crystalline aluminosilicates. 4,478,806, Cl. 423-328.000.

Ballain, Marlyn D.: *See*—
Christini, Roy A.; Rolles, Rolf; Bowman, Kenneth A.; and Ballain, Marlyn D., 4,478,637, Cl. 75-67.00R.

Ballard, Larry, to Shakespeare Company. High temperature extruded polyvinyl alcohol monofilament and process for the preparation thereof. 4,478,971, Cl. 524-376.000.

Balordi, Romano: *See*—
Ritter, Frank; and Balordi, Romano, 4,478,121, Cl. 83-209.000.

Balzer, Dieter; and Kosswig, Kurt, to Chemische Werke Huels, A.G. Process for extracting oil from a subterranean reservoir. 4,478,281, Cl. 166-274.000.

Bandoli, Fulvio: *See*—
Andrione, Norbert; and Bandoli, Fulvio, 4,478,559, Cl. 417-368.000.

Banes, Alexander J., to G & W Electric Company. Pyrotechnic current interrupter. 4,479,105, Cl. 337-4.000.

Bankert, Ralph A.; and Dumas, David H., to Hercules Incorporated. Sizing method and sizing composition for use therein. 4,478,682, Cl. 162-158.000.

Bannink, Engbert T., Jr.; and Olson, Glenn O., to Boeing Company, The. Integral lightning protection system for composite aircraft skins. 4,479,163, Cl. 361-218.000.

Banov, Mikhail D.; Oshkin, Anatoly I.; and Chernyshev, Alexandr N., to Toliyattinsky Politekhnichesky Institut. Bipolar flexible water-cooled cable. 4,479,029, Cl. 174-15.0WF.

Barabas, Eva: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, 4,478,745, Cl. 260-112.50R.

Baraona, Cosmo R.; Mazaris, George A.; and Chai, An-ti, to United States of America, National Aeronautics and Space Administration. Screen printed interdigitated back contact solar cell. 4,478,879, Cl. 427-85.000.

Barbano, Normand, to GTE Products Corporation. Bi-loop antenna system. 4,479,127, Cl. 343-742.000.

Barbeau, Damien M. M.: *See*—
Druais, Robert E. J.; and Barbeau, Damien M. M., 4,478,030, Cl. 56-60.000.

Barberis, Dario: *See*—
Casalone, Enrico; and Barberis, Dario, 4,478,319, Cl. 188-170.000.

Barker, David: *See*—
Ariss, Stephen A.; Measures, John C.; and Barker, David, 4,478,868, Cl. 426-641.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz; and Hertell, Siegfried, 4,478,562, Cl. 418-88.000.

Barnes, Allan F.; and Wallace, Clarence L., to Cookson Group plc. Production of vitreous enamelled substrates. 4,478,884, Cl. 427-97.000.

Barnes, Derek; Dessens, Jan A. H.; and Rosenberg, George N., to MacMillan, Bloedel Limited. Apparatus for blending wood strands with a liquid resin. 4,478,896, Cl. 427-421.000.

Barrut, Luc P. Process and apparatus for treating teeth. 4,478,580, Cl. 433-223.000.

Bartera, Ralph E.: *See*—
Haines, Eldon L.; and Bartera, Ralph E., 4,478,211, Cl. 126-433.000.

Barth, Peter; and Blaudszun, Bernd, to Lohmann GmbH & Co. KG. Process and apparatus for recovery of solvents. 4,478,686, Cl. 203-49.000.

Barth, Wayne E., to Pfizer Inc. Bis-esters of alkanediols. 4,478,748, Cl. 260-245.20R.

Bartur, Meir; and Nicolet, Marc, to Solid State Devices, Inc. Tungsten barrier contact. 4,478,881, Cl. 427-90.000.

BASF Aktiengesellschaft: *See*—
Buethe, Ingolf; Marx, Matthias; Schleier, Gisbert; and Peters, Reinhard, 4,478,960, Cl. 521-160.000.
Distler, Harry; and Hock, Karl-Ludwig, 4,478,759, Cl. 260-465.50A.
Fischer, Karl; Grenacher, Armin V.; Herr, Manfred; and Strohmeyer, Max, 4,479,012, Cl. 568-454.000.
Goertz, Hans-Helmut; Marcinowski, Stefan; and Sanner, Axel, 4,478,976, Cl. 525-54.100.
Ilmer, Andreas; and Andreae, Karl, 4,479,150, Cl. 358-310.000.
Klahr, Erhard; Rebafka, Walter; Nissen, Axel; Trieselt, Wolfgang; and Hettche, Albert, 4,479,016, Cl. 568-606.000.

Schulz, Gunter; Buschmann, Ernst; and Zeeh, Bernd, 4,478,758, Cl. 260-465.00D.

Basnett, Robert T., to Westinghouse Electric Corp. Contact overtravel adjustment apparatus for a vacuum contactor. 4,479,042, Cl. 200-144.00B.

Basquin, Maurice H.: *See*—
Shafler, Dale A.; Kay, John W.; and Basquin, Maurice H., 4,478,415, Cl. 273-1.50R.

Bass, Ann H.; Blaschak, Jeffery G.; Marouf, Mohamed A.; Vancil, Paul W.; and Winchell, David F., to AT&T Bell Laboratories. Method and apparatus for controlling ports in a digital conference arrangement. 4,479,211, Cl. 370-62.000.

Basturk, Abdurrahman N.: *See*—
Cognard, Jacques; and Basturk, Abdurrahman N., 4,478,739, Cl. 252-299.100.

Batlivala, Percy P.; and Kommsrusch, Richard S., to Motorola, Inc. Same frequency repeater for a multiple repeater system. 4,479,245, Cl. 455-18.000.

Batorewicz, Wadim; and Wheeler, Edward L., to Uniroyal, Inc. Preparation of p-nitrosodiphenylamine. 4,479,008, Cl. 564-433.000.

Battigelli, Jean A.; and Plantard, Dominique, to Isover Saint-Gobain. Process and apparatus for improving the distribution on a receiving device of fibers carried by a gas current. 4,478,624, Cl. 65-4.400.

Bauer, Hartmut; Bonse, Bernhard; and Schmidt, Peter, to Robert Bosch GmbH. Control system for an internal combustion engine with externally supplied ignition. 4,478,186, Cl. 123-436.000.

Bauer, Walter, to AGFA-Gevaert Aktiengesellschaft. Means for holding X-ray films. 4,479,232, Cl. 378-187.000.

Baugh, Benton F.; Lux, Gerard J-M.; and Ribeyre, Jean-Paul, to Schlumberger Technology Corporation. Pipe gripping apparatus with interlocking plates. 4,478,292, Cl. 173-149.000.

Bausch & Lomb Incorporated: *See*—
Parnell, James A., 4,479,032, Cl. 178-19.000.

Bavelloni, Franco, to Z. Bavelloni S.P.A. Tool positioning device for machining the edges of sheet or plate materials. 4,478,007, Cl. 51-100.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Slater, Glenn L.; Weiler, Gerhard H.; Turoff, Robert; and Kitterman, Lawrence (said Slater, Turoff and Kitterman assors. to), 4,478,342, Cl. 215-32.000.

Bayer Aktiengesellschaft: *See*—
Brandes, Wilhelm; and Daum, Werner, 4,478,848, Cl. 424-285.000.
Jonas, Friedrich; Hocker, Jurgen; and Broich, Bruno, 4,478,751, Cl. 260-396.00N.
Kabbe, Hans-Joachim, 4,479,007, Cl. 549-401.000.
Muller, Friedhelm; and Nickel, Horst, 4,478,681, Cl. 162-140.000.
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,478,738, Cl. 252-188.310.
Schonfelder, Manfred; Haas, Peter; Avar, Geza; and Steinberger, Helmut, 4,478,893, Cl. 427-387.000.

Bayer, Harmon S.: *See*—
Venditti, Paul L.; and Bayer, Harmon S., 4,478,138, Cl. 98-33.00R.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Muller, Rudi; and Pauly, Axel, 4,478,431, Cl. 280-710.000.

Beasley, Daniel T.: *See*—
Sheck, Wah; Beasley, Daniel T.; and Myles, Walter E., 4,479,148, Cl. 358-290.000.

Beaudoux, Michel; and Vuillet, Jean-Pierre, to Societe Alsacienne De Constructions Mecaniques De Mulhouse. Device for actuating shedding motion searching and slow speed operation on a loom. 4,478,254, Cl. 139-1.00E.

Bechara, Ibrahim S.; and Mascioli, Rocco L., to Air Products and Chemicals, Inc. Amino and amido divalent metal carboxylates useful as catalysts for polyurethane formulations. 4,478,959, Cl. 521-124.000.

Becher, Heinz-Manfred; Drandarevski, Christo A.; and Lust, Sigmund, to Celamerck GmbH & Co. KG. Urea derivatives having a pesticidal activity. 4,478,852, Cl. 424-322.000.

Becker, James R.; Raymond, Edward L.; and Cameron, David W., to Cameron Iron Works, Inc. Method of producing a lined structure. 4,477,955, Cl. 29-157.10R.

Becker, Michael L., to Figgie International, Inc. Universal four flap opener. 4,478,023, Cl. 53-382.000.

Beckman Instruments, Inc.: *See*—
Kampf, Richard S.; and Dowling, Henry G., 4,479,054, Cl. 250-328.000.

Beecham Group Limited: *See*—
Ainsworth, Anthony T.; and Smith, David G., 4,478,849, Cl. 424-285.000.

Beier, Lothar; Zemann, Arnold; and Wachter, Helmut. Damping means for drawing heads. 4,479,137, Cl. 346-141.000.

Beier, Stefan, to Kaltenbach & Voigt GmbH & Co. Dental treatment apparatus. 4,479,182, Cl. 364-413.000.

Beil, Valentin: *See*—
Herr, Francis V.; Walklet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., 4,478,339, Cl. 211-126.000.

Bekooij, Jurrianus; Raudenbusch, Werner T.; Stachowiak, Stephen A.; Kooijmans, Petrus G.; and Scholten, Henricus P. H., to Shell Oil Company. Process for the preparation of resinous compounds, compounds produced thereby and their use in thermosetting coating compositions. 4,478,985, Cl. 525-530.000.

Belko, Robert P.; Boden, Richard M.; and Hansa, Marie R., to International Flavors & Fragrances Inc. Organoleptic uses of norbornyl oxyacetaldehyde. 4,478,743, Cl. 252-522.00R.

Bell and Howell Company: *See*—
Helffrich, David J., 4,479,050, Cl. 235-474.000.

Belouet, Christian, to Compagnie Generale D'Electricite. Method of fabricating polycrystalline silicon strips. 4,478,880, Cl. 427-86.000.

Belt, Roger F.; and Uhrin, Robert, to Litton Systems, Inc. Method for decreasing radial temperature gradients of crystal growth melts utilizing radiant energy absorptive materials and crystal growth chambers comprising such materials. 4,478,676, Cl. 156-616.00R.

Bender, Bernd, to Vickers, Incorporated. Electrically controllable valve assembly. 4,478,245, Cl. 137-554.000.

Bendix Corporation, The: *See*—
Frear, David L., 4,478,473, Cl. 339-89.00M.
Gallusser, David O.; and Peterson, Ann E., 4,478,474, Cl. 339-89.00M.
Henrich, Robert S.; and Walworth, John A., 4,479,161, Cl. 361-154.000.

Bengeser, Georg; and Ranke, Gerhard, to Linde Aktiengesellschaft. Control of carbon monoxide partial pressure in sour gas absorption system. 4,478,799, Cl. 423-224.000.

Benjamin, James M., to AT&T Bell Laboratories. Worm gear mechanism. 4,478,103, Cl. 74-425.000.

Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., to GTE Products Corporation. Process for producing refractory powder. 4,478,888, Cl. 427-220.000.

Benko, John M. Fifth wheel plate. 4,478,425, Cl. 280-433.000.

Benneche, Tore; Gacek, Mikkel; and Undheim, Kjell, to Nyegaard & Co. A/S. Substituted pyrimid-2-ones, the salts thereof, processes for their preparation and pharmaceutical compositions containing them. 4,478,839, Cl. 424-251.000.

Benner, Lester C.: *See*—
Brady, Thomas R.; and Benner, Lester C., 4,478,869, Cl. 427-10.000.

Benson, Inc.: *See*—
Doggett, David E., 4,478,480, Cl. 350-3.710.

Benzing, J. Paige: *See*—
Siniscal, Paul D.; Benzing, J. Paige; and Matte, Louis G., 4,478,327, Cl. 193-40.000.

Bercx, Helmut: *See*—
Hoppe, Hans; Bercx, Helmut; and Siegel, Wolfgang, 4,478,517, Cl. 366-101.000.

Berge, Charles T.: *See*—
Mack, Mark P.; and Berge, Charles T., 4,478,952, Cl. 502-110.000.

Berger, David D.: *See*—
Maddox, James W.; and Berger, David D., 4,478,238, Cl. 137-171.000.

Berger, Pierre; and Gelus, Maurice, to Creusot-Loire. Process and apparatus for hydrolyzing cellulose material. 4,478,644, Cl. 127-1.000.

Bergveld, Piet: *See*—
Koning, Gerrit; and Bergveld, Piet, 4,478,222, Cl. 128-632.000.

Berneiser, Herwig M. Tool for aiding in thread connecting a spark plug or other object in place. 4,478,113, Cl. 81-64.000.

Bernier, Claude. Fireplace tongs. 4,478,449, Cl. 294-10.000.

Berry, Alan D., to United States of America, Navy. Low temperature deposition of nickel films. 4,478,890, Cl. 427-252.000.

Berti, Eugenio, to Burroughs Corporation. Servomechanisms. 4,479,177, Cl. 364-159.000.

Best Industries, Inc.: *See*—
Elorriaga, Peter, Jr., 4,478,438, Cl. 285-276.000.

Bester, Anthony V. Collapsible frame for portable shelters. 4,478,234, Cl. 135-98.000.

Bethlehem Steel Corporation: *See*—
Larson, Duane B., 4,478,119, Cl. 83-42.000.

Bhalla, Ranbir S., to North American Philips Lighting Corp. High intensity vapor discharge lamp with sintering aids for electrode emission materials. 4,479,074, Cl. 313-628.000.

Bhula, Dilipkumar N.: *See*—
Birdy, Jal N.; and Bhula, Dilipkumar N., 4,478,537, Cl. 405-217.000.

Bianchi, Massimiliano: *See*—
Sarfati, Alberto G.; Bianchi, Massimiliano; and Riva, Merate, 4,478,375, Cl. 242-47.010.

Bierweller, Gerhard, to Kochs Adler AG. Needle guard of a sewing machine. 4,478,162, Cl. 112-227.000.

Binder, Rolf; and Hanselmann, Daniel, to Rieter Machine Works, Ltd. Apparatus and method for opening a fiber bale. 4,477,944, Cl. 19-80.00R.

Birdy, Jal N.; and Bhula, Dilipkumar N., to Brian Watt Associates, Inc. Arctic caisson system. 4,478,537, Cl. 405-217.000.

Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, to Institut Francais du Petrole. Process for the hydrotreatment of hydrocarbons in an expanded or ebullated catalyst bed. 4,478,707, Cl. 208-157.000.

Bjornholt, John E., to Motorola, Inc. Auto-balance method and apparatus for suppression of residual lines in a transmitted spectrum. 4,479,227, Cl. 375-1.000.

BL Technology Limited: *See*—
Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., 4,477,986, Cl. 73-40.700.

Black, William L.; and Moore, Kenneth L., to United States of America, Navy. Projectile carrier for liquid propellant gun. 4,478,128, Cl. 89-7.000.

Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., to Warner-Lambert Company. Confections containing stabilized peppermint oil. 4,478,864, Cl. 426-534.000.

Blake, Colin C.; Goodall, Charles C. O.; and Bacon, Paul A., to Ciba-Geigy AG. Pressurized filtration system. 4,478,714, Cl. 210-136.000.

Blake, William W.; and Coutant, Alan R., to Caterpillar Tractor Co. Pressure modulating and reducing valve. 4,478,237, Cl. 137-116.300.

Blanchard, Vernon F. Golf practicing aid. 4,478,422, Cl. 273-187.00R.

Blancou, Hubert; Commeyras, Auguste; and Teissedre, Robert, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of fluorinated products. 4,478,760, Cl. 260-465.700.

Blankenship, Michael G.; and Keck, Donald B., to Corning Glass Works. Polarization retaining single-mode optical waveguide. 4,478,489, Cl. 350-96.300.

Blaschak, Jeffery G.: *See*—
Bass, Ann H.; Blaschak, Jeffery G.; Marouf, Mohamed A.; Vancil, Paul W.; and Winchell, David F., 4,479,211, Cl. 370-62.000.

Blaudszun, Bernd: *See*—
Barth, Peter; and Blaudszun, Bernd, 4,478,686, Cl. 203-49.000.

Bleeke, William F., to CTS Corporation. Precision linear potentiometer sensor. 4,479,107, Cl. 338-176.000.

Bloom, James W., to Armour Pharmaceutical Company. Warm ethanol method for preparation of low fibrinogen antihemophilic factor. 4,478,825, Cl. 424-101.000.

Bloss, Wolfgang; and Mohn, Ulrich, to L. & C. Steinmuller GmbH. Method of treating final products from flue gas desulfurization. 4,478,810, Cl. 423-555.000.

Blossfeld, Lothar, to ITT Industries, Inc. Process for manufacturing a monolithic integrated solid-state circuit comprising at least one bipolar planar transistor. 4,477,965, Cl. 29-576.00B.

Blue Circle Projects (Proprietary) Limited: *See*—
Moore, Richard P., 4,478,726, Cl. 210-793.000.

Bly, Kenneth B.; Chmiel, Edward J.; and Martyniuk, Ernest T., to General Motors Corporation. Diesel exhaust particulate trap with plural filter tubes. 4,478,618, Cl. 55-314.000.

BMI, Inc.: *See*—
Dudro, Harry R., Jr.; and Morris, Frank E., 4,478,395, Cl. 266-196.000.

Board of Trustees Operating Michigan State University: *See*—
Smucker, Alvin J. M.; McBurney, Shawn L.; and Srivastava, Ajit K., 4,478,710, Cl. 209-17.000.

Bobik, Carl F.: *See*—
Huseby, Irvin C.; and Bobik, Carl F., 4,478,785, Cl. 264-65.000.

Boden, Richard M.: *See*—
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., 4,478,743, Cl. 252-522.00R.

Boehringer Ingelheim KG: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; and Stockhaus, Klaus, 4,478,844, Cl. 424-273.00R.

Boeing Company, The: *See*—
Bannink, Engbert T., Jr.; and Olson, Glenn O., 4,479,163, Cl. 361-218.000.
Loch, David M., 4,478,689, Cl. 204-14.100.

Boger, Joshua S.: *See*—
Veber, Daniel F.; and Boger, Joshua S., 4,478,826, Cl. 424-177.000.

Bohrer, Philip J., to Honeywell Inc. Flow sensor. 4,478,076, Cl. 73-204.000.

Bohrer, Philip J.; and Johnson, Robert G., to Honeywell Inc. Flow sensor. 4,478,077, Cl. 73-204.000.

Bond, Curtis J., to Liqui-Box Corporation. Finger-actuated push-pull slideable dispensing valve. 4,478,242, Cl. 137-383.000.

Bonin, Werner: *See*—
Tessier, Jean; Demoute, Jean-Pierre; and Bonin, Werner, 4,478,850, Cl. 424-304.000.

Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; Schramm, Herbert; and Viess, Walter, to Robert Bosch GmbH. Internal combustion engine knock sensing method and system. 4,478,068, Cl. 73-35.000.

Bonnaud, Bernard: *See*—
Mouzin, Gilbert; Cousse, Henri; Bonnaud, Bernard; Morre, Michel; and Stenger, Antoine, 4,478,836, Cl. 424-248.540.

Bonse, Bernhard: *See*—
Bauer, Hartmut; Bonse, Bernhard; and Schmidt, Peter, 4,478,186, Cl. 123-436.000.

Bookbinder, David. Synchronization indicator for at least two carburetors. 4,479,108, Cl. 340-52.00R.

Boom, W. Steven, to Dow Chemical Company, The. Process for separating salts in aqueous streams. 4,478,722, Cl. 210-672.000.

Bor, Zsolt; and Schafer, Fritz P., to Max-Planck-Gesellschaft Zur Foerderung Der Wissenschaften e.V. Method and apparatus for generating ultra-short individual laser pulses. 4,479,220, Cl. 372-25.000.

Boreskov, Georgy K.: *See*—
Matros, Jury S.; Boreskov, Georgy K.; Lakhmostov, Viktor S.; Volkov, Viktor J.; and Ivanov, Alexei A., 4,478,808, Cl. 423-522.000.

Borg-Warner Chemicals, Inc.: *See*—
Halpern, Yuval; Mott, Donna M.; and Niswander, Ron H., 4,478,998, Cl. 544-195.000.

Borg-Warner Corporation: *See*—
Carlson, David K.; Burnia, William G.; and Haley, William J., 4,478,322, Cl. 192-0.055.

Borrman, Bo: *See*—
Andersson, Ingmar; Borrman, Bo; Fredin, Bo; and Nylund, Olov, 4,478,786, Cl. 376-444.000.

Bosch-Siemens Hausgeraete GmbH: *See*—
Lotz, Helmut, 4,478,057, Cl. 62-480.000.

Boschetti, Egisto: *See*—
Girot, Pierre; and Boschetti, Egisto, 4,478,713, Cl. 210-101.000.

Bowman, Kenneth A.: *See*—
Christini, Roy A.; Rolles, Rolf; Bowman, Kenneth A.; and Ballain, Marlyn D., 4,478,637, Cl. 75-67.00R.

Bowyer, Michael L., to Baker International Corporation. Apparatus with annulus safety valve for through tubing injection and method of use. 4,478,288, Cl. 166-372.000.

Boyd, Thomas J., Jr.: *See*—
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,479,218, Cl. 372-2.000.

Boyles, Robert L. Weighing scale. 4,478,303, Cl. 177-210.0FP.

BP Nutrition (UK) Limited: *See*—
Fisher, John; and Holman, David, 4,478,175, Cl. 119-16.000.

Braddock, Elijah Y. Rotary motor. 4,478,132, Cl. 91-485.000.

Bradley, Martin P. T.; Miller, Leslie A.; McCall, Thomas J.; and Middlebusher, Duane L., to Spectra-Physics, Inc. Autosampler mechanism. 4,478,095, Cl. 73-864.210.

Brady, Thomas R.; and Benner, Lester C., to Owens-Corning Fiberglas Corporation. Applying granules to strip asphaltic material. 4,478,869, Cl. 427-10.000.

Bralorne Resources Limited: *See*—
Tomm, Wayne R.; and Ring, Curt, 4,478,284, Cl. 166-297.000.

Brandes, Wilhelm; and Daum, Werner, to Bayer Aktiengesellschaft. Combating fungi with substituted anilinomethylene-oximes. 4,478,848, Cl. 424-285.000.

Brandt, Lennart; and Pichl, Heinz, to AB Volvo Penta. Inboard outboard drive and mounting shield therefor. 4,478,585, Cl. 440-112.000.

Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., to United States of America, Energy. Free electron laser using Rf coupled accelerating and decelerating structures. 4,479,218, Cl. 372-2.000.

Brauer, Larry F.: *See*—
Hennings, George N.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,478,127, Cl. 89-1.50D.
Hennings, George N.; Brauer, Larry F.; and Nickles, Richmond H., 4,478,147, Cl. 102-255.000.

Braun Nursery Limited: *See*—
Braun, Peter, 4,478,260, Cl. 140-92.100.

Braun, Peter, to Braun Nursery Limited. Wire basket, apparatus and method. 4,478,260, Cl. 140-92.100.

Braunstein, Pierre: *See*—
Kervennal, Jacques; Cognion, Jean-Marie; and Braunstein, Pierre, 4,478,757, Cl. 260-453.0PC.

Brennan, William D.: *See*—
Masso, Jon D.; Brennan, William D.; and Rotenberg, Don H., 4,478,873, Cl. 427-40.000.

Brenneman, William L., to Olin Corporation. Modifications to a cooperative rolling system for increasing maximum attainable reduction per pass. 4,478,064, Cl. 72-232.000.

Brenner, Kenneth I.; and Wollschlager, Joseph F., to Sundstrand Corporation. Arrangement for slipper cavitation erosion control and impact reduction. 4,478,130, Cl. 91-6.500.

Brettschneider, Johannes; Dobler, Klaus; Haag, Gottlob; Linder, Ernst; and Polach, Wilhelm, to Robert Bosch GmbH. Apparatus to remove solid particles and aerosols from a gas, especially from the exhaust gas of an internal combustion engine. 4,478,613, Cl. 55-127.000.

Breuer, Ami S.: *See*—
Rosenbaum, Ralph L.; and Breuer, Ami S., 4,478,276, Cl. 165-164.000.

Brian Watt Associates, Inc.: *See*—
Birdy, Jal N.; and Bhula, Dilipkumar N., 4,478,537, Cl. 405-217.000.

Bridges, William G.; and Foster, Craig A., to Olin Corporation. Spray grainer. 4,478,170, Cl. 118-64.000.

Bridges, William G.; and Foster, Craig A., to Olin Corporation. Variably displaceable spray nozzles. 4,478,171, Cl. 118-64.000.

Bright, David R.: *See*—
Williams, Robert D.; Bright, David R.; Young, Vernon V.; and Martin, Jerome L., 4,478,935, Cl. 435-75.000.

Bright, Royal E.: *See*—
Chan, Lawrence W., 4,477,981, Cl. 34-41.000.

Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., to Stromberg-Carlson Corp. Arrangement of interactive processors for control of ports. 4,479,034, Cl. 179-18.0ES.

Bristol, Howard A.: *See*—
Khaja, Farees U.; Ernest, Robert O.; Gronwick, Jerry P.; and Bristol, Howard A., 4,479,047, Cl. 219-225.000.

British Aerospace Public Limited Company: *See*—
Fletcher, James; and Wooding, Michael S., 4,478,377, Cl. 244-12.500.

British Petroleum Company Limited, The: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,478,806, Cl. 423-328.000.

British Petroleum Company p.l.c., The: *See*—
Brown, Harold T., 4,478,072, Cl. 73-61.00R.

Brittain, David R.; and Wood, Robin, to Imperial Chemical Industries PLC. 1'-Substituted-spiro[pyrrolidine-3,3'-indoline]-2,2',5-triones. 4,478,847, Cl. 424-274.000.

Brixy, Heinz; von Mallinckrodt, Detmar; and Justus, Volker, to Kernforschungsanlage Julich GmbH. Measuring resistor for a noise thermometer. 4,479,026, Cl. 136-232.000.

Broadwater, Robert P., to Babcock & Wilcox Company, The. Nuclear power plant feedwater controller design. 4,478,783, Cl. 376-211.000.

Brock, Andrew J.; and Mandigo, Frank N., to Olin Corporation. Protective film on Cu-Sn alloys. 4,478,651, Cl. 148-31.500.

Broich, Bruno: *See*—
Jonas, Friedrich; Hocker, Jurgen; and Broich, Bruno, 4,478,751, Cl. 260-396.00N.

Brown, Baxter: *See*—
Brown, William R.; and Brown, Baxter, 4,478,017, Cl. 52-209.000.

Brown, Gordon. Coupling of unrelated engine and transmission. 4,478,593, Cl. 464-182.000.
Brown Group Recreational Products, Inc.: *See*—
Ziegler, William H., Jr., 4,478,410, Cl. 272-85.000.
Brown, Harold T., to British Petroleum Company p.l.c., The. Apparatus for determining the concentration of solids dispersed in a liquid. 4,478,072, Cl. 73-61.00R.
Brown, Ivan R.; and Sheehan, Terrence M., to Hardinge Brothers, Inc. Slant bed for chucker machine. 4,478,117, Cl. 82-32.000.
Brown, Patsy R.: *See*—
Hartman Peter W.; and Brown, Patsy R., 4,479,207, Cl. 367-107.000.
Brown, William M.; and Dunn, Robert T., to Astech, Inc. Telephone extension system utilizing power line carrier signals. 4,479,033, Cl. 179-2.510.
Brown, William R.; and Brown, Baxter. Flooring protection system. 4,478,017, Cl. 52-209.000.
Brown & Williamson Tobacco Corporation: *See*—
Luke, John A., 4,478,229, Cl. 131-336.000.
Bruce, Charles W., to United States of America, Army. Dewpoint measurement system for near saturation conditions. 4,478,080, Cl. 73-335.000.
Brucher, Eberhard; and Schussler, Karl-Heinz, to Dango & Dienenthal Maschinenbau GmbH. Mechanically operated tongs for gripping round objects. 4,478,451, Cl. 294-106.000.
Bruckner, Georg F. Hand and forearm protective device for the interception of thrusts in martial arts. 4,478,408, Cl. 272-76.000.
Bruhn, Larry C. Fuel treating apparatus for internal combustion engines. 4,478,198, Cl. 123-548.000.
Bruker Analytische Messtechnik GmbH: *See*—
Gast, Jurgen; Wunsch, Lutz; and Zachmann, Gunter, 4,479,058, Cl. 250-343.000.
Brungel, Norbert: *See*—
Velling, Gunther; and Brungel, Norbert, 4,478,725, Cl. 210-703.000.
Brunner, Anton; and Rieskamp, Klaus, to Siemens Aktiengesellschaft. Polarization means for generating circularly polarized electro-magnetic waves. 4,479,128, Cl. 343-756.000.
Bruylants, Philippe M.; and Garten, Robert L., to Ashland Oil, Inc. Styrene from toluene and formaldehyde. 4,479,024, Cl. 585-437.000.
Bryan, William M., to SmithKline Beckman Corporation. Synthesis of benzhydrylamine resins. 4,478,984, Cl. 525-333.600.
Buannec, Michel, to Regie Nationale des Usines Renault. Suction cap for an automatic gearbox. 4,478,107, Cl. 74-863.000.
Buchanan, Charles W., to Sornborger, William. Picture frame. 4,477,990, Cl. 40-155.000.
Buchler, Wilhelm; and Mischlau, Karl-Hermann, to Dyckerhoff & Widmann Aktiengesellschaft. Scaffolding girder for constructing multiple-span bridge structures movable from one bridge to another. 4,478,773, Cl. 264-31.000.
Buckley, Bruce S. Self-organizing circuits for automatic pattern recognition and the like and systems embodying the same. 4,479,241, Cl. 382-15.000.
Buethe, Ingolf; Marx, Matthias; Schleier, Gisbert; and Peters, Reinhard, to BASF Aktiengesellschaft. Diphenylmethane diisocyanate-based liquid polyisocyanate mixtures containing urethane groups, process for their preparation and their use for the preparation of flexible polyurethane foams. 4,478,960, Cl. 521-160.000.
Bulkley, Clifford T.: *See*—
Shaw, David N.; and Bulkley, Clifford T., 4,478,054, Cl. 62-323.400.
Bullock, Robert F. Fryer with oil circulation and conveyor. 4,478,140, Cl. 99-404.000.
Bumgarner, Kie. Elevated wire supported rodent trap. 4,477,997, Cl. 43-58.000.
Buna-O-Matic Corporation: *See*—
Zimmerman, John D., 4,478,139, Cl. 99-280.000.
Bupp, James R.; Markovich, Voya; Napp, Tracy E.; and Sambucetti, Carlos J., to International Business Machines Corporation. Conditioning of a substrate for electroless direct bond plating in holes and on surfaces of a substrate. 4,478,883, Cl. 427-97.000.
Burchiel, Scott W.; Rhodes, Buck A.; and Crockford, David R., to Nuc-Med, Inc.; and University Patents, Inc. Composition and method for detecting cancer with technetium labeled antibody fragments. 4,478,815, Cl. 424-1.100.
Burelbach, James P., to United States of America, Energy. Passive heat transfer means for nuclear reactors. 4,478,784, Cl. 376-298.000.
Burke, Joseph D.: *See*—
Zobel, Frederick A.; Burke, Joseph D.; and Oppy, John T., 4,478,867, Cl. 426-570.000.
Burnecke, Manfred; and Nyman, Swen, to Jurgens Maschinenbau GmbH & Co. KG. Method and devices for constructing a shackled conveyor belt from helical elements. 4,477,959, Cl. 29-433.000.
Burnia, William G.: *See*—
Carlson, David K.; Burnia, William G.; and Haley, William J., 4,478,322, Cl. 192-0.055.
Burns & Russell Company, The: *See*—
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Burroughs Corporation: *See*—
Berti, Eugenio, 4,479,177, Cl. 364-159.000.
Loskorn, Richard A.; and Jevons, Lyle O., Jr., 4,479,123, Cl. 340-825.060.
Madsen, Craig C.; Stewart, Daniel B.; and Andree, James, 4,479,111, Cl. 340-365.00P.
Stopper, Herbert, 4,479,088, Cl. 324-73.00R.
Burton, Donald J.; and Flynn, Richard M., to University of Iowa Research Foundation. Method for preparing fluorine-containing phosphonates. 4,478,761, Cl. 260-970.000.
Burton, James: *See*—
Haber, Edgar; and Burton, James, 4,478,827, Cl. 424-177.000.
Buschman, Bob D.; Muth, Glenn D.; and O'Connell, Ronald T., to M/A-COM DCC, Inc. Interface apparatus and method for asynchronous encoding of digital television. 4,479,142, Cl. 358-13.000.
Buschmann, Ernst: *See*—
Schulz, Gunter; Buschmann, Ernst; and Zeeh, Bernd, 4,478,758, Cl. 260-465.00D.
Butt, Alan G.: *See*—
Friedman, Irwin R.; Foust, Harry D.; and Butt, Alan G., 4,478,277, Cl. 165-185.000.
Buttonwood Communication Corporation: *See*—
Young, Michael F., 4,479,246, Cl. 455-50.000.
Bykov, Vladimir I.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.
Byrne, Joe L.: *See*—
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Byrt, Graham A. B. Sheet stacking apparatus. 4,478,403, Cl. 271-189.000.
C. A. Schroeder, Inc.: *See*—
Schroeder, Clifford A.; and Fogg, Ralph L., 4,478,657, Cl. 156-64.000.
C. A. Weidmuller GmbH & Co.: *See*—
Undin, Hans; and Wiener, Hans, 4,478,110, Cl. 81-9.510.
Cabaud, Aime , to Societe Comatel S.A. Device for inserting contacts on a support card. 4,477,969, Cl. 29-739.000.
Caddy, Roy: *See*—
Schauder, Colin D.; and Caddy, Roy, 4,479,082, Cl. 318-799.000.
Caimi, Giovanni: *See*—
Ferri, Beniamino; and Caimi, Giovanni, 4,479,089, Cl. 324-158.00F.
Cal-Tron Corporation: *See*—
Marhold, Werner; and Pool, Danny J., 4,479,038, Cl. 200-6.00A.
Calabro, Anthony S. Belt buckle construction. 4,477,949, Cl. 24-180.000.
Caldwell, Donald B., to MAS Mfg. Corp. Method and apparatus for removal of downhole well debris. 4,478,285, Cl. 166-311.000.
California Strolee, Inc.: *See*—
Hyde, Richard E.; and Carmichael, Lee T., 4,478,427, Cl. 280-642.000.
Cameron, David W.: *See*—
Becker, James R.; Raymond, Edward L.; and Cameron, David W., 4,477,955, Cl. 29-157.10R.
Cameron Iron Works, Inc.: *See*—
Becker, James R.; Raymond, Edward L.; and Cameron, David W., 4,477,955, Cl. 29-157.10R.
Camino Laboratories, Inc.: *See*—
Bailey, Wilber H., 4,478,224, Cl. 128-706.000.
Campbell, Anthony K.; Simpson, John S. A.; and Woodhead, James S., to Welsh National School of Medicine, The. Detecting or quantifying substances using labelling techniques. 4,478,817, Cl. 424-7.100.
Campbell, James B.: *See*—
Smith, Edgar C.; and Campbell, James B., 4,478,639, Cl. 430-9.000.
Canadair Limited: *See*—
Kerr, John P., 4,478,379, Cl. 244-17.110.
Canadian Drilling Equipment Ltd.: *See*—
Futros, Ernest M., 4,478,291, Cl. 173-147.000.
Canadian Patents & Development Limited: *See*—
Ranger, Martial, 4,478,174, Cl. 118-718.000.
Canellos, Demitrious. Honeycomb structure chucking. 4,478,662, Cl. 156-155.000.
Canon Kabushiki Kaisha: *See*—
Fujii, Haruo; and Ando, Yujiro, 4,478,510, Cl. 355-15.000.
Iwakura, Sadao, 4,479,132, Cl. 346-76.0PH.
Kato, Masatake, 4,478,496, Cl. 350-427.000.
Kawai, Tohru, 4,478,491, Cl. 350-255.000.
Kawanabe, Tsuyoshi, 4,479,134, Cl. 346-140.00R.
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Koizumi, Yuichiro; and Kaneko, Toshie, 4,479,061, Cl. 250-487.100.
Tsuji, Sadahiko; and Tsunekawa, Tokuichi, 4,478,503, Cl. 354-480.000.
Yokota, Hideo, 4,478,493, Cl. 350-336.000.
Yoshioka, Seishiro; Hirai, Yutaka; Fukuda, Tadaji; Fukaya, Masaki; and Nakagiri, Takashi, 4,479,149, Cl. 358-294.000.
Capps, Timothy L., to Turra International, Inc. Device for atomizing and dispersing fuel in a fuel/air mixture. 4,478,607, Cl. 48-189.000.
Capuani, Alfredo, to Aeritalia-Societa Aerospaziale Italiana-per Azioni. Aircraft with jet propulsion. 4,478,378, Cl. 244-12.500.
Carborundum Abrasives Company: *See*—
Parekh, Dhan N.; and Schweyen, Paul R., 4,478,610, Cl. 51-298.000.
Cardenas-Franco, Luis; Veazey-Menendez, Enrique; and Heredia-De-La-Paz, Jorge Alfredo, to Vitro-Tec Fideicomiso. Solenoid actuated valve blocks for glassware forming machines. 4,478,241, Cl. 137-340.000.
Carl Freudenberg, Firma: *See*—
Tamura, Tadashi, 4,478,620, Cl. 55-486.000.

Carl, William P.: *See—*
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,478,695, Cl. 204-98.000.
Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Hoerenz, Peter G., 4,478,499, Cl. 351-211.000.
Carlson, David K.; Burnia, William G.; and Haley, William J., to Borg-Warner Corporation. Lockup clutch control system. 4,478,322, Cl. 192-0.055.
Carlson, Dean R.: *See—*
Eads, Thomas C.; and Carlson, Dean R., 4,478,409, Cl. 272-85.000.
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., to Kopper Company, Inc. Method for preparing phenolic foams using anhydrous aryl sulfonic acid catalysts. 4,478,958, Cl. 521-121.000.
Carmichael, Lee T.: *See—*
Hyde, Richard E.; and Carmichael, Lee T., 4,478,427, Cl. 280-642.000.
Carrier Corporation: *See—*
Drucker, Alan S., 4,478,055, Cl. 62-324.100.
Michaels, Donald D., Jr., 4,478,056, Cl. 62-332.000.
Carrier, John A., to Plessey Overseas Limited. Pivotal mounting system. 4,478,382, Cl. 248-185.000.
Carrillo, Angel L., to Gillette Company, The. Inhibition of body odor. 4,478,821, Cl. 424-47.000.
Carson, Don B., to UOP Inc. Utility and hydrogen conservation in hydrogen recycle processes. 4,479,189, Cl. 364-500.000.
Carter, Russell P., Jr., to Mobay Chemical Corporation. Polycarbonate-silicate compositions. 4,478,964, Cl. 523-216.000.
Casadei, Marino: *See—*
Folli, Giulio; and Casadei, Marino, 4,478,568, Cl. 425-320.000.
Casalone, Enrico; and Barberis, Dario, to WABCO Westinghouse Compagnia Freni S.p.A. Spring-applied brake unit for railway vehicle with manual release arrangement. 4,478,319, Cl. 188-170.000.
Casio Computer Co., Ltd.: *See—*
Hoshii, Toshifumi, 4,478,123, Cl. 84-1.030.
Caspari, Frederick W.; Smith, Bruce E.; and Heuer, Daniel A., to Magnavox Company, The. Frequency synthesized tuning system using a microprocessor. 4,479,248, Cl. 455-183.000.
Cassou, Bertrand; Cassou, Robert; and Cassou, Maurice. Apparatus for filling artificial insemination straws with semen. 4,478,261, Cl. 141-2.000.
Cassou, Maurice: *See—*
Cassou, Bertrand; Cassou, Robert; and Cassou, Maurice, 4,478,261, Cl. 141-2.000.
Cassou, Robert: *See—*
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Blake, William W.; and Coutant, Alan R., 4,478,237, Cl. 137-116.300.
Cates, Robert P., to Reliance Electric Company. Efficiency increasing circuit for switching power supplies operating at low power levels. 4,479,174, Cl. 363-21.000.
Celamerck GmbH & Co. KG.: *See—*
Becher, Heinz-Manfred; Drandarevski, Christo A.; and Lust, Sigmund, 4,478,852, Cl. 424-322.000.
Celanese Corporation: *See—*
Kuder, James E.; and East, Anthony J., 4,478,782, Cl. 264-345.000.
Cena, Lawrence; and Mason, Ted D., to Atchison, Topeka and Santa Fe Railway Company. Railway container and car. 4,478,155, Cl. 105-355.000.
Centre D'Etudes Du Fraisage: *See—*
Sachot, Michel, 4,478,540, Cl. 409-211.000.
Centre National d'Etudes Spatiales: *See—*
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,249, Cl. 455-208.000.
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,255, Cl. 455-246.000.
Centre Stephanois De Recherches Mecaniques Hydromecanique Et Frottement Zone Industrielle: *See—*
Gaucher, Antoine, 4,478,731, Cl. 252-36.000.
Cetus Corporation: *See—*
Salomaa, Kari; Merrill, Roy; Leath, Richard; Wennberg, Timothy; and Widunas, Joseph, 4,478,094, Cl. 73-863.320.
Chabernaud, Daniel: *See—*
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Chan, Lawrence W., to Bright, Royal E. Dynamic drying simulator. 4,477,981, Cl. 34-41.000.
Chandler Evans, Inc.: *See—*
Cropper, George D.; and Gentile, Anthony J., 4,478,038, Cl. 60-39.020.
Chang, Jenq-Sian; and Chang, Yih-Jau, to Storage Technology Partners. Self-aligning process for placing a barrier metal over the source and drain regions of MOS semiconductors. 4,478,679, Cl. 156-653.000.
Chang, Keh-Minn: *See—*
Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., 4,478,791, Cl. 420-590.000.
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Chang, Jenq-Sian; and Chang, Yih-Jau, 4,478,679, Cl. 156-653.000.
Chapin, Charles C.; Conley, James H.; and Jamison, Robert G., to United States of America, Army. Method for regenerating hydraulic systems. 4,478,235, Cl. 137-15.000.
Charles Stark Draper Laboratory, The: *See—*
De Fazio, Thomas L.; and Whitney, Daniel E., 4,477,975, Cl. 33-169.00C.
Chaussee, James G., to S. C. Johnson & Son, Inc. Skin conditioning composition. 4,478,853, Cl. 424-358.000.
Checinski, Stanley S., to Siemens-Allis, Inc. Circuit breaker with self-adjusting armature. 4,479,101, Cl. 335-37.000.
Chef Automatique International Ltd.: *See—*
Montgomery, F. Dorsey; and Norin, Allan A., 4,478,861, Cl. 426-295.000.
Chemie Linz Aktiengesellschaft: *See—*
Raninger, Franz, 4,478,999, Cl. 544-241.000.
Chemische Werke Huels: *See—*
Doerffel, Joerg; and Zech, Hans-Joachim, 4,478,994, Cl. 528-304.000.
Chemische Werke Huels, A.G.: *See—*
Balzer, Dieter; and Kosswig, Kurt, 4,478,281, Cl. 166-274.000.
Chemplex Company: *See—*
Pullukat, Thomas J.; and Hoff, Raymond E., 4,478,988, Cl. 526-128.000.
Chen, Jung S.: *See—*
Mezei, Louis M.; Chen, Jung S.; Huang, John J.; and Lovins, Robert E., 4,478,744, Cl. 260-112.50R.
Chen, Lee; Chuang, Tung J.; and Mathad, Gangadhara S., to International Business Machines Corporation. Laser induced dry etching of vias in glass with non-contact masking. 4,478,677, Cl. 156-635.000.
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N. Method for processing wastes resulting from production of phosphorus, namely, slime and off-gasses, with utilization of the resultant products. 4,478,633, Cl. 71-37.000.
Chernyshev, Alexandr N.: *See—*
Banov, Mikhail D.; Oshkin, Anatoly I.; and Chernyshev, Alexandr N., 4,479,029, Cl. 174-15.0WF.
Cherry, Hitesh; and Werner, Walter M., to AMP Incorporated. Electrical terminal. 4,478,479, Cl. 339-273.00R.
Cherry, Sidney J.; and White, Richard A., to Westinghouse Electric Corp. Unitary end closure and seal shield member for vacuum interrupter. 4,478,347, Cl. 200-144.00B.
Cheshier, Charles L.; and Lewis, Don W. Swivel connector. 4,478,435, Cl. 285-39.000.
Chevron Research Company: *See—*
Ergas, Raymond A., 4,479,183, Cl. 364-421.000.
King, William F., 4,478,832, Cl. 424-210.000.
Chi, Chao S., to Sperry Corporation. Adjustable equalizer. 4,479,152, Cl. 360-46.000.
Chikamasa, Hiroshi: *See—*
Sakaguchi, Masaaki; Satoh, Shinichi; Kiuchi, Seiji; and Chikamasa, Hiroshi, 4,478,376, Cl. 242-191.000.
Chin, Aland K.; and Dutt, Bulusu V., to AT&T Bell Laboratories. Method of making p-i-n photodiodes. 4,477,964, Cl. 29-572.000.
Chister, Rene A. Tobacco smoking pipe. 4,478,228, Cl. 131-180.000.
Chmiel, Edward J.: *See—*
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Christian, Ken E.: *See—*
Herr, Francis V.; Walklet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., 4,478,339, Cl. 211-126.000.
Christini, Roy A.; Rolles, Rolf; Bowman, Kenneth A.; and Ballain, Marlyn D., to Aluminum Company of America. Thermal reduction process for production of magnesium. 4,478,637, Cl. 75-67.00R.
Chronar Corporation: *See—*
Gau, Shek-Chung; and Dalal, Vikram L., 4,478,654, Cl. 148-174.000.
Chu, Pochen, to Mobil Oil Corporation. Activity enhancement of high silica zeolites by thermal treatment with alkaline aluminate. 4,478,950, Cl. 502-85.000.
Chuang, Tung J.: *See—*
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Chugai Ro Co., Ltd.: *See—*
Kitayama, Hideo; and Niwa, Haruho, 4,478,573, Cl. 432-124.000.
Chujo, Yoshihiro: *See—*
Kato, Akinori; and Chujo, Yoshihiro, 4,478,508, Cl. 355-14.00R.
Chung, Rack H., to General Electric Company. Process of coating a substrate with an abrasion resistant ultraviolet curable composition. 4,478,876, Cl. 427-54.100.
Ciba-Geigy AG: *See—*
Blake, Colin C.; Goodall, Charles C. O.; and Bacon, Paul A., 4,478,714, Cl. 210-136.000.
Ciba-Geigy Corporation: *See—*
Hasse, Jaroslav; and Palmberg, Roger, 4,478,724, Cl. 210-679.000.
Issler, Heinz; and Maul, Rudolf, 4,479,021, Cl. 568-868.000.
Jaffe, Edward E., 4,478,968, Cl. 524-88.000.
Martin, Henry, 4,478,756, Cl. 260-429.700.
Meyer, Hans R.; and Morf, Max, 4,478,598, Cl. 8-648.000.
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,478,635, Cl. 71-92.000.
Reid, William J., 4,478,986, Cl. 526-83.000.

Renfroe, Harris B., 4,478,842, Cl. 424-263.000.
Cimarusti, Christopher M.: *See*—
Koster, William H.; and Cimarusti, Christopher M., 4,478,749, Cl. 260-245.400.
Cipri, Teno P. Automobile burglar alarm and arming circuit for same. 4,479,110, Cl. 340-63.000.
Cisek, Kenneth E.; and Kamp, Ewald A., to Union Carbide Corporation. Closure. 4,477,950, Cl. 24-30.50P.
Citizen Watch Company Limited: *See*—
Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, 4,478,524, Cl. 368-204.000.
CL Industries, Inc.: *See*—
Woodson, Wayne D., 4,478,962, Cl. 523-144.000.
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Tophinke, Franz, 4,478,226, Cl. 130-27.00T.
Clarion Co., Ltd.: *See*—
Nishikawa, Yasuhisa; Tanaka, Yoshio; Hasumi, Ryoichi; and Koizumi, Takashi, 4,478,098, Cl. 74-10.330.
Tanaka, Yoshio, 4,478,097, Cl. 74-10.330.
Clark, James R., to Rockwell International Corporation. Hydraulic brake actuator. 4,478,137, Cl. 92-63.000.
Clark, Leonard R.; and Meehl, David W., to SPS Technologies, Inc. Lockable storage system. 4,478,466, Cl. 312-215.000.
Clark, Richard L., to Concept Design, Inc. Apparatus for supporting and aligning splicing tape on a splicing wheel. 4,478,674, Cl. 156-505.000.
Clark & Vicario Corporation: *See*—
Kaiser, Robert G., 4,478,615, Cl. 55-170.000.
Clemens, Robert M. Carrier apparatus and hose for fire fighters. 4,478,452, Cl. 294-141.000.
Cleveland, Ronald N.: *See*—
Cochran, John M., Jr.; and Cleveland, Ronald N., 4,478,301, Cl. 177-70.000.
Clifford, Earl W.; Perhach, John M.; and Sorce, Peter S., to Aro Corporation, The. Vacuum package tester and method. 4,478,070, Cl. 73-49.300.
Cobey, Herbert T. Compost turning and shredding apparatus. 4,478,520, Cl. 366-345.000.
Coca-Cola Company, The: *See*—
Gudnason, Geir V., 4,478,645, Cl. 127-57.000.
Cochran, John M., Jr.; and Cleveland, Ronald N., to Frontier Electronics, Inc. Apparatus for controlling the filling of weigh pans. 4,478,301, Cl. 177-70.000.
Coddens, Donald L.; and Van Belle, Paul D. Ventilation system for reducing the humidity in an attic or roof cavity space. 4,478,366, Cl. 236-44.00A.
Cogan, Adrian I., to GTE Laboratories Incorporated. Method of fabrication of a low capacitance self-aligned semiconductor electrode structure. 4,477,963, Cl. 29-571.000.
Cognard, Jacques; and Basturk, Abdurrahman N., to Asulab S.A. Dark colored composition based on liquid crystals. 4,478,739, Cl. 252-299.100.
Cognion, Jean-Marie: *See*—
Kervennal, Jacques; Cognion, Jean-Marie; and Braunstein, Pierre, 4,478,757, Cl. 260-453.0PC.
Cohen, Abraham D., to Exxon Research & Engineering Co. Zeolite L catalyst for reforming. 4,478,706, Cl. 208-138.000.
Cohen, Enrico; and Good, Jeremy A., to Imperial College of Science & Technology; and Cryogenic Consultants Ltd. Method and apparatus for separating dry magnetic material. 4,478,711, Cl. 209-39.000.
Cohn, Steven J., to Discovision Associates. Vertical code verifier. 4,479,146, Cl. 358-147.000.
Cole, Herbert S., Jr., to General Electric Company. Power outage indicator. 4,479,118, Cl. 340-663.000.
Coleman, Tommy W.; and Griffin, Robert A., to Kerr-McGee Chemical Corporation. Method for electrodepositing metallic manganese. 4,478,697, Cl. 204-105.00M.
Colton, James P.: *See*—
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Combustion Engineering, Inc.: *See*—
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Siegel, Leon S., 4,479,164, Cl. 361-235.000.
Comeau, Jean-Francois: *See*—
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Comet, Francois: *See*—
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Commers, Louis P., to Suburban Duplicator Repair, Inc. Envelope feeder for a duplicating press. 4,478,400, Cl. 271-3.100.
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Commonwealth of Australia: *See*—
Skinner, David R.; Stokes, Rex A.; Freeman, Lewis O.; and McNeill, Alan R., 4,478,513, Cl. 356-323.000.
Compagnie Francaise de Raffinage: *See*—
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Compagnie Generale D'Electricite: *See*—
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Compagnie Neerlandaise de l'Azote (Soci'ete' Anonyme): *See*—
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., 4,478,632, Cl. 71-29.000.
Componenti Grafici S.r.l.: *See*—
Molinatto, Bruno, 4,477,954, Cl. 29-116.0AD.
Computer Election Systems: *See*—
Fogg, M. Charles; Krieger, Charles F.; and Veale, John R., 4,479,194, Cl. 364-900.000.
Concannon, Thomas P.; and Rummel, Mitzie K., to Du Pont de Nemours, E. I., and Company. Melt processable perfluorocarbon resin with degradation retarder. 4,478,965, Cl. 523-218.000.
Concast AG: *See*—
Lipton, Jan, 4,478,272, Cl. 164-454.000.
Concast Service Union AG: *See*—
Navarro, Carlos R.; and Mallen Fuentes, Jose M., 4,478,271, Cl. 164-426.000.
Concept Design, Inc.: *See*—
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Conley, James H.: *See*—
Chapin, Charles C.; Conley, James H.; and Jamison, Robert G., 4,478,235, Cl. 137-15.000.
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., to Standard Oil Company (Indiana). Synthesis gas reaction. 4,478,954, Cl. 518-700.000.
Connor, John. Illuminated mirror assembly. 4,479,172, Cl. 362-135.000.
Conrady, James A., to B. F. Goodrich Company, The. Dielectric heat sealed coatings. 4,478,972, Cl. 524-388.000.
Continental Group, Inc., The: *See*—
Fitko, Chester W., deceased, 4,478,667, Cl. 156-307.300.
Hekal, Ihab M.; and Erlandson, Paul M., 4,478,860, Cl. 426-267.000.
Cook, Norman, to Lever Brothers Company. Child resistant containers. 4,478,348, Cl. 220-318.000.
Cook, Robert D., to Crane Co. Apparatus for generating a lead signal in an antiskid system. 4,479,185, Cl. 364-426.000.
Cookson Group plc: *See*—
Barnes, Allan F.; and Wallace, Clarence L., 4,478,884, Cl. 427-97.000.
Cool-Zip Inc.: *See*—
DeMarco, David, 4,478,265, Cl. 150-52.00R.
Coomans, Abraham: *See*—
T'Jampens, Germain R.; and Coomans, Abraham, 4,479,071, Cl. 313-25.000.
Copal Company Limited: *See*—
Ishiguro, Yasuo, 4,478,500, Cl. 354-443.000.
Copeland Corporation: *See*—
King, Robert W., 4,478,243, Cl. 137-512.100.
Coppelman, Maurice A.: *See*—
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Copper Cliff Door Manufacturing (1980) Limited: *See*—
Palmer, Glenn R., 4,478,268, Cl. 160-310.000.
Cordis Europa N.V.: *See*—
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Corning Glass Works: *See*—
Adair, Peter J.; Hobczuk, Michael P.; Kingsbury, Paul I.; and Nelson, John W., 4,478,641, Cl. 106-110.000.
Blankenship, Michael G.; and Keck, Donald B., 4,478,489, Cl. 350-96.300.
Olshansky, Robert, 4,478,622, Cl. 65-3.120.
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Corporacion Nacional Del Cobre De Chile: *See*—
Wilkomirsky, Igor; Reghezza, Andres; and Petit-Laurent, Hector, 4,478,698, Cl. 204-106.000.
Cosden Technology, Inc.: *See*—
Hahn, Granville J., 4,478,874, Cl. 427-40.000.
Costello, James. Combined pliers, clamp and wrench. 4,477,937, Cl. 7-139.000.
Cotton, Carran D., to Maytag Company, The. Microcontroller-based dryer control. 4,477,982, Cl. 34-48.000.
Couch, Harold T.: *See*—
Kesten, Arthur S.; and Couch, Harold T., 4,478,814, Cl. 423-650.000.
Coulon, Philip S., Jr.: *See*—
Kidd, H. Keith; and Coulon, Philip S., Jr., 4,479,078, Cl. 318-254.000.
Courteheuse, Gerard: *See*—
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Cousse, Henri: *See*—
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Coutant, Alan R.: *See*—
Blake, William W.; and Coutant, Alan R., 4,478,237, Cl. 137-116.300.
Craiglow, Robert L., to Rockwell International Corporation. Noise floor automatic gain control. 4,479,254, Cl. 455-239.000.
Crane Co.: *See*—
Cook, Robert D., 4,479,185, Cl. 364-426.000.
Crane, Ronald C., to 3Com Corporation. Local computer network transceiver. 4,479,228, Cl. 375-7.000.
Crawford, Don L.; and Pometto, Anthony L., III, to Genetics International, Inc. Biologically produced acid precipitable polymeric lignin. 4,478,747, Cl. 435-72.000.
Crescenzi, Robert J.; Daniels, John U., Jr.; and Roberts, Gerald L., to General Electric Company. Piezoelectric crystal electrodes and method of manufacture. 4,477,952, Cl. 29-25.350.
Creusot-Loire: *See*—
Berger, Pierre; and Gelus, Maurice, 4,478,644, Cl. 127-1.000.

Criss, Russell C., to PPG Industries, Inc. Magnetic sputtering anode reconditioning. 4,478,700, Cl. 204-192.00R.

Criss, Russell C.: *See—*
Gillery, F. Howard; and Criss, Russell C., 4,478,702, Cl. 204-298.000.

Crockford, David R.: *See—*
Burchiel, Scott W.; Rhodes, Buck A.; and Crockford, David R., 4,478,815, Cl. 424-1.100.

Cropper, George D.; and Gentile, Anthony J., to Chandler Evans, Inc. Electronic fuel control with manual training mode. 4,478,038, Cl. 60-39.020.

Crosfield Data Systems, Inc.: *See—*
Rossini, Ernest M., 4,479,147, Cl. 358-290.000.
Sheck, Wah; Beasley, Daniel T.; and Myles, Walter E., 4,479,148, Cl. 358-290.000.

Crosslen, Louis J., to Frank Mayer & Associates, Inc. Display device of the type having racks arranged in shingled fashion. 4,478,338, Cl. 211-490.000.

Cryogenic Consultants Ltd.: *See—*
Cohen, Enrico; and Good, Jeremy A., 4,478,711, Cl. 209-39.000.

CTS Corporation: *See—*
Bleeke, William F., 4,479,107, Cl. 338-176.000.

Cullinan, George J.: *See—*
Fleisch, Jerome H.; Marshall, Winston S.; and Cullinan, George J., 4,478,820, Cl. 424-45.000.

Cumming, James C., to Rockwell International Corporation. Trailer braking system. 4,478,459, Cl. 303-7.000.

Cuscurida, Michael; and Krause, Walter P., to Texaco Inc. Procedure for the alkoxylation of polyoxyalkyleneamines. 4,479,010, Cl. 564-477.000.

Cyrpo, Incorporated: *See—*
Pearson, William S., 4,478,555, Cl. 417-7.000.

D. W. Zimmerman Mfg., Inc.: *See—*
Knight, Donn C.; Kish, Robert J.; and Fox, Albert D., 4,478,390, Cl. 254-270.000.
Owen, Douglas B., 4,478,558, Cl. 417-296.000.

Dagiel, Richard T., to Aetna Bearing Company. Self-adjusting bearing. 4,478,325, Cl. 192-98.000.

Dahlen, Anne-Marie; and Strinning, Olof B. S., to Arla, Ekonomisk Forening. Protein containing fruit drink and process for the manufacture thereof. 4,478,855, Cl. 426-41.000.

Daicel Chemical Industries, Ltd.: *See—*
Yuki, Heimei; and Okamoto, Yoshio, 4,478,953, Cl. 502-155.000.

Dainippon Screen Manufacturing Co., Ltd.: *See—*
Miyauchi, Yoshio, 4,478,511, Cl. 355-28.000.

Daito Seiki Company Limited: *See—*
Sugimoto, Tadahiro, 4,478,120, Cl. 83-71.000.

Dal-Craft, Inc.: *See—*
Dalbo, Lorraine E.; and Dalbo, Emil J., 4,478,333, Cl. 206-380.000.

Dalal, Vikram L.: *See—*
Gau, Shek-Chung; and Dalal, Vikram L., 4,478,654, Cl. 148-174.000.

Dalbo, Emil J.: *See—*
Dalbo, Lorraine E.; and Dalbo, Emil J., 4,478,333, Cl. 206-380.000.

Dalbo, Lorraine E.; and Dalbo, Emil J., to Dal-Craft, Inc. Needlecraft case with extender. 4,478,333, Cl. 206-380.000.

Dana Corporation: *See—*
Sink, William H., 4,478,324, Cl. 192-70.170.

Dango & Dienenthal Maschinenbau GmbH: *See—*
Brucher, Eberhard; and Schussler, Karl-Heinz, 4,478,451, Cl. 294-106.000.

Daniel Industries, Inc.: *See—*
Sanchez, Ruben; and McEver, R. M., Jr., 4,478,251, Cl. 138-44.000.

Daniel, James W., Jr., to RCA Corporation. Phaselock receiver with input signal measuring capability. 4,479,253, Cl. 455-226.000.

Daniels, John U., Jr.: *See—*
Crescenzi, Robert J.; Daniels, John U., Jr.; and Roberts, Gerald E., 4,477,952, Cl. 29-25.350.

Dankwort, Rudolf C.: *See—*
Frische, Richard H.; Dankwort, Rudolf C.; and Klem, Charles D., 4,479,070, Cl. 310-338.000.

Danuzzi, Max: *See—*
Votteler, Arno; Danuzzi, Max; Dubach, Fredi; and Schreiner, Herbert, 4,479,030, Cl. 174-48.000.

Dart Industries Inc.: *See—*
Picozza, Augusto A., 4,478,450, Cl. 294-31.200.

Daudt, Stephen W.: *See—*
Wood, Charles L.; Mapes, Glenn H.; and Daudt, Stephen W., 4,478,629, Cl. 65-163.000.

Daughton, John W.; Gray, Gary A.; Wilczek, Stephen A.; and Steiner, Edward, to Xerox Corporation. Control system and interface for electrostatographic machines. 4,478,509, Cl. 355-14.00C.

Dauksch, Stephen F.: *See—*
Alexander, Robert P.; Pichia, Robert J.; and Dauksch, Stephen F., 4,477,970, Cl. 29-837.000.

Daum, Werner: *See—*
Brandes, Wilhelm; and Daum, Werner, 4,478,848, Cl. 424-285.000.

Davidson, Donald J., to Rockwell International Corporation. Slack adjuster for a disc brake. 4,478,316, Cl. 188-71.900.

Davies, David L., to Micro Control Systems, Inc. Three dimensional graphics tablet. 4,477,973, Cl. 33-1.0CC.

Dawson, Gerthen L., Jr. Demountable lawn edger/mower combination. 4,478,028, Cl. 56-16.900.

Dawson, Sylvan L., to Rockwell International Corporation. Noise blanker. 4,479,251, Cl. 455-219.000.

Dayco Corporation: *See—*
Gayer, Melvin D., 4,478,594, Cl. 474-50.000.
Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., 4,478,154, Cl. 105-225.000.
Lewis, Charles M., 4,478,661, Cl. 156-92.000.

De Rotterdamsche Droogdok MIJ B.V.: *See—*
Klaassen, Lambertus G. M., 4,478,308, Cl. 180-326.000.

deBoer, Nico: *See—*
LeGlue, Michael J.; and deBoer, Nico, 4,478,389, Cl. 254-108.000.

De Coene, Frans J. G. C.; and Naaktgeboren, Adrianus, to Sperry Corporation. Mower-conditioner. 4,478,027, Cl. 56-16.400.

Deere & Company: *See—*
Moore, James W.; and Wanie, Lee J., 4,478,029, Cl. 56-17.500.
Stecklein, Gary L., 4,477,987, Cl. 37-118.00R.

De Fazio, Thomas L.; and Whitney, Daniel E., to Charles Stark Draper Laboratory, The. Adjustable remote center compliance device. 4,477,975, Cl. 33-169.00C.

De Franco, Philip N.; and Jones, Henry F., Jr., to Massey-Ferguson Services N.V. Synchronizer mechanism. 4,478,321, Cl. 192-53.00E.

DeHarrold, Raymond H.: *See—*
Hennings, George N.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,478,127, Cl. 89-1.50D.

de Hek, Johan A., to Veco Beheer B.V. Process of manufacturing screen material. 4,478,688, Cl. 204-11.000.

de Keijzer, Johannes, to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie). Digital detector for a multi-frequency code in an analog signal. 4,479,188, Cl. 364-484.000.

Delago, Pierre C., to American Hoist & Derrick Company. Swing bearing quick removal system. 4,478,340, Cl. 212-253.000.

Delano, Tony M. Compressed air power engine. 4,478,304, Cl. 180-165.000.

DeLigt, John, to Westvaco Corporation. Veneer finishing machine. 4,478,609, Cl. 51-295.000.

Del Vecchio, Robert M.: *See—*
Holland, James R.; and Del Vecchio, Robert M., 4,477,958, Cl. 29-423.000.

DeMarco, David, to Cool-Zip Inc. Reusable insulating jacket for beverage containers. 4,478,265, Cl. 150-52.00R.

Demole, Edouard P.; and Enggist, Paul, to Firmenich SA. Utilization of sulfur containing terpenes as flavoring ingredients. 4,478,865, Cl. 426-535.000.

Demoute, Jean-Pierre: *See—*
Tessier, Jean; Demoute, Jean-Pierre; and Bonin, Werner, 4,478,850, Cl. 424-304.000.

Den Boer, Leland A. Bale handling apparatus. 4,478,547, Cl. 414-24.500.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Kishida, Kozi; Iwato, Noboru; and Ozeki, Yuji, 4,478,903, Cl. 428-216.000.

Denley, Ronald S.; and Van Zeeland, Anthony J., to Oak Industries Inc. Tactile feel switch with positive switch actuation. 4,479,040, Cl. 200-77.000.

Denny, William A.: *See—*
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,479,000, Cl. 546-23.000.

Derby, Norwin C.; and Williamson, Robert R., to Super Sack Manufacturing Corporation. Collapsible receptacle with prefabricated lift loops and method of making. 4,479,243, Cl. 383-24.000.

De Roo, Pierre R.; Gilliams, Yvan K.; and Van Gijsel, Francine, to AGFA-Gevaert N.V. Fusible electrostatically attractable toner. 4,478,923, Cl. 430-110.000.

Dessaint, Andre L.; and Lina, Marie-Jose , to Atochem. Compositions and process for the oilproofing and waterproofing treatment of construction materials. 4,478,975, Cl. 524-871.000.

Dessens, Jan A. H.: *See—*
Barnes, Derek; Dessens, Jan A. H.; and Rosenberg, George N., 4,478,896, Cl. 427-421.000.

DeVall, Donald L.; and DeVall, Hu D. Rotary valve. 4,478,248, Cl. 137-624.130.

DeVall, Hu D.: *See—*
DeVall, Donald L.; and DeVall, Hu D., 4,478,248, Cl. 137-624.130.

Development Finance Corporation of New Zealand: *See—*
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., 4,479,000, Cl. 546-23.000.

De Winter, Walter F.: *See—*
Van Gossum, Lucien J.; Marien, August M.; De Winter, Walter F.; and Van Thillo, Etienne A., 4,478,907, Cl. 428-327.000.

Diamond Shamrock Chemicals Company: *See—*
Hereda, Maryellen; and Fischer, Stephen A., 4,478,795, Cl. 423-127.000.
Kelley, Edwin L.; Herzberg, Walter J.; and Sinka, Joseph V., 4,478,602, Cl. 44-51.000.

Diaz, Zaida; and Miller, James H., to Shell Oil Company. Drying substantially supercritical CO_2 with glycerol. 4,478,612, Cl. 55-29.000.

DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., to Hussmann Corporation. Oil separation for refrigeration system. 4,478,050, Cl. 62-193.000.

Dicke, William C., to Singer Company, The. In-line sander. 4,478,010, Cl. 51-170.0TL.

Dickens, David R.; Smith, Waldo; and Malin, Herbert, to Teknor Apex Company. Floor mat construction. 4,478,901, Cl. 428-120.000.

Diesel Kiki Co., Ltd.: *See—*
Yamada, Keiichi, 4,478,187, Cl. 123-449.000.

Dietrich, Jerry L.: *See*—
Rozmus, Walter J.; and Dietrich, Jerry L., 4,478,788, Cl. 419-48.000.

Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, to Ethicon, Inc. Ligating clip cartridge. 4,478,220, Cl. 128-326.000.

Dills, Raymond L., to General Electric Company. Air sensing control system for air conditioners. 4,478,048, Cl. 62-126.000.

Dinwiddie, John M., Jr., to International Business Machines Corporation. Synchronous cycle steal mechanism for transferring data between a processor storage unit and a separate data handling unit. 4,479,179, Cl. 364-200.000.

Director General of Agency of Industrial Science and Technology: *See*—
Sato, Kazuhiko; Nakamura, Genshiro; and Yukimoto, Yoshinori, 4,479,028, Cl. 136-249.000.

Discovision Associates: *See*—
Cohn, Steven J., 4,479,146, Cl. 358-147.000.

Distler, Harry; and Hock, Karl-Ludwig, to BASF Aktiengesellschaft. Preparation of aminoitriles. 4,478,759, Cl. 260-465.50A.

Ditzig, Albert F., to RE-AL, Inc. Method of mounting and cleaning electrical slide switch of flush through design. 4,478,364, Cl. 228-201.000.

Diwell, Alan F.; and Salathiel, Andrew, to Johnson Matthey & Company Limited. Exhaust gas purification. 4,478,797, Cl. 423-213.500.

Dmitrenko, Valentina V.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Dobbs, Robert J.: *See*—
Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., 4,478,888, Cl. 427-220.000.

Dobler, Klaus: *See*—
Brettschneider, Johannes; Dobler, Klaus; Haag, Gottlob; Linder, Ernst; and Polach, Wilhelm, 4,478,613, Cl. 55-127.000.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,478,833, Cl. 424-246.000.

Doehler, Joachim, to Energy Conversion Devices, Inc. Method and apparatus for sensing and controlling the intensity of energy in a deposition system. 4,478,173, Cl. 118-688.000.

Doerffel, Joerg; and Zech, Hans-Joachim, to Chemische Werke Huels. Use of unsaturated polyesters as additive binders improving adhesion in coating agents for coating of metals. 4,478,994, Cl. 528-304.000.

Doggett, David E., to Benson, Inc. Holographic scanner spinner wobble correction system. 4,478,480, Cl. 350-3.710.

Domingo, George, to Hughes Aircraft Company. Serpentine charge coupled device. 4,479,201, Cl. 365-183.000.

Doncer, Alex J.: *See*—
White, Harold R.; and Doncer, Alex J., 4,477,939, Cl. 15-246.500.

Donlon, Harold E.: *See*—
Herr, Francis V.; Walkiet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., 4,478,339, Cl. 211-126.000.

Dorenkamp, Richard; Faupel, Werner; Geyer, Gerhard; and Jager, Erich, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,478,195, Cl. 123-502.000.

Dorling, Rolf; and Premel, Ulrich, to L. & C. Steinmuller GmbH. Substantially vertical apparatus for cooling process gases originating from a gasification process. 4,478,606, Cl. 48-77.000.

Dorling, Rolf; and Premel, Ulrich, to L. & C. Steinmuller GmbH. Method of treating process gases coming from a gasification reactor. 4,478,608, Cl. 48-210.000.

Dorman, Earl C., to Olin Corporation. Safety shield. 4,478,314, Cl. 187-9.00R.

Dorosz, Dennis D. E., to Trend Rock Bit Alberta, Ltd. Rock bit construction. 4,478,299, Cl. 175-369.000.

Dow Chemical Company, The: *See*—
Boom, W. Steven, 4,478,722, Cl. 210-672.000.
Etzell, Bobby R.; Carl, William P.; and Mod, William A., 4,478,695, Cl. 204-98.000.
Freedman, Harold H., 4,478,938, Cl. 435-181.000.
Hilkhafer, Douglas K., 4,478,941, Cl. 436-56.000.
Holland, Ann C., 4,478,640, Cl. 106-76.000.
Johnston, Howard; and Troxell, Lillian H., 4,479,001, Cl. 546-291.000.
Kleschick, William A., 4,479,005, Cl. 548-230.000.
Langer, Horst G.; and Fellmann, Jere D., 4,478,805, Cl. 423-311.000.
Lee, Do I.; and Mundorf, Traute, 4,478,974, Cl. 524-533.000.

Dowling, Henry G.: *See*—
Kampf, Richard S.; and Dowling, Henry G., 4,479,054, Cl. 250-328.000.

Drandarevski, Christo A.: *See*—
Becher, Heinz-Manfred; Drandarevski, Christo A.; and Lust, Sigmund, 4,478,852, Cl. 424-322.000.

Drevitch, Nolan A.; and Green, Lawrence E., to Polaroid Corporation. Frame for transparency film. 4,477,991, Cl. 40-158.00B.

Drewett, Glen E.; and Guynes, Kenneth W., to Drewett, Glen E. Adjustable length shock absorbing arrangement for a marine structure. 4,478,536, Cl. 405-213.000.

Drolet, Jean P.: *See*—
Lalancette, Jean M.; and Drolet, Jean P., 4,478,796, Cl. 423-155.000.

Druais, Robert E. J.; and Barbeau, Damien M. M., to Hesston Corporation. Machine for cutting forage plants. 4,478,030, Cl. 56-60.000.

Drucker, Alan S., to Carrier Corporation. Method and apparatus for improving heat pump performance by controlling discharge of indoor fan thermal energy. 4,478,055, Cl. 62-324.100.

Dubach, Fredi: *See*—
Votteler, Arno; Danuzzi, Max; Dubach, Fredi; and Schreiner, Herbert, 4,479,030, Cl. 174-48.000.

DuBois, R. Clark, to Gradco Systems, Inc. Apparatus for sorting photocopies. 4,478,406, Cl. 271-293.000.

Duchac, Joseph O.: *See*—
Fuller, Robert L., 4,478,116, Cl. 82-4.00A.

Duchange, Jean-Pierre: *See*—
Gabano, Jean-Paul; and Duchange, Jean-Pierre, 4,478,920, Cl. 429-191.000.

Ducheyne, Paul L. R.; and Hench, Larry L., to University of Florida. Metal fiber reinforced bioglass composites. 4,478,904, Cl. 428-288.000.

Ducruy Guy R.: *See*—
Lhommeau, Robert E.; and Ducruy Guy R., 4,478,563, Cl. 425-71.000.

Dudro, Harry R., Jr.; and Morris, Frank E., to BMI, Inc. Refractory runner. 4,478,395, Cl. 266-196.000.

Duggan, Eric. Method of treating and coating a fabric web. 4,478,886, Cl. 427-210.000.

Dujovny, Manuel; and Rozario, Rodney A. Temporary microvascular occluder. 4,478,219, Cl. 129-325.000.

Duke, John C., to Southwire Company. Hot-rolling mill and method. 4,478,063, Cl. 72-42.000.

Dukowski, Hubert G., to H.G.D. Enterprises Ltd. Portable air filtration device. 4,478,216, Cl. 128-204.210.

Dumas, David H.: *See*—
Bankert, Ralph A.; and Dumas, David H., 4,478,682, Cl. 162-158.000.

Dunham-Bush, Inc.: *See*—
Shaw, David N.; and Bulkley, Clifford T., 4,478,054, Cl. 62-323.400.

Dunkl, Franz C.: *See*—
Finkelstein, Manuel; Dunkl, Franz C.; and Ross, Sidney D., 4,479,166, Cl. 361-433.000.

Dunn, Charles: *See*—
Hohman, Charles M.; Propster, Mark A.; Dunn, Charles; and Seng, Stephen, 4,478,627, Cl. 65-27.000.

Dunn, Charles S., to Owens-Corning Fiberglas Corporation. Method for controlling the level of molten material in a furnace. 4,478,628, Cl. 65-29.000.

Dunn, Elman R., to Litton Industrial Products, Inc. Thermally stabilized double disc grinding machine. 4,478,008, Cl. 51-111.00R.

Dunn, Robert T.: *See*—
Brown, William M.; and Dunn, Robert T., 4,479,033, Cl. 179-2.510.

Du Pont de Nemours, E. I., and Company: *See*—
Concannon, Thomas P.; and Rummel, Mitzie K., 4,478,965, Cl. 523-218.000.
Fickes, Michael G.; and Shobert, Alan L., 4,478,931, Cl. 430-309.000.
Mack, Mark P.; and Berge, Charles T., 4,478,952, Cl. 502-110.000.
Robbins, Gordon B., 4,478,755, Cl. 260-429.500.
Roura, Miguel J., 4,478,978, Cl. 525-66.000.
Smith, Dewey H., Jr., 4,478,840, Cl. 424-260.000.
Whitney, Joel G., 4,478,845, Cl. 424-273.00R.

Duran, John A., to Avibank Mfg., Inc. Adjustable keeper assembly. 4,478,446, Cl. 292-341.180.

Durand, Guy; and Roby, Gerard, to Legrand S.A. Electrical apparatus with retaining means for a terminal screw. 4,478,478, Cl. 339-263.00R.

Dutt, Bulusu V.: *See*—
Chin, Aland K.; and Dutt, Bulusu V., 4,477,964, Cl. 29-572.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Buchler, Wilhelm; and Mischlau, Karl-Hermann, 4,478,773, Cl. 264-31.000.

E. R. Squibb & Sons, Inc.: *See*—
Koster, William H.; and Cimarusti, Christopher M., 4,478,749, Cl. 260-245.400.

E. W. Bliss Company, Inc.: *See*—
Huzyak, Paul E., 4,478,062, Cl. 72-17.000.

Eads, Thomas C.; and Carlson, Dean R. Swing chain. 4,478,409, Cl. 272-85.000.

East, Anthony J.: *See*—
Kuder, James E.; and East, Anthony J., 4,478,782, Cl. 264-345.000.

Eastman Kodak Company: *See*—
Gross, Robert C.; and Gross, Susan C., 4,478,944, Cl. 436-95.000.
Hess, Thomas C.; and Wiegers, Karl E., 4,478,928, Cl. 430-217.000.
Jones, Cynthia G.; and Hill, Cliff O., 4,478,929, Cl. 430-217.000.
Kane, James L., 4,478,402, Cl. 271-100.000.
Miskinis, Edward T., 4,478,925, Cl. 430-137.000.
Perlstein, Jerome H.; and Haley, Neil F., 4,478,922, Cl. 430-58.000.
Yacobucci, Paul D.; and Wilson, John C., 4,478,992, Cl. 526-288.000.

Eaton Corporation: *See*—
Hoppie, Lyle O.; McNinch, Joseph H., Jr.; and Nowell, Gregory C., 4,478,777, Cl. 264-102.000.
Marquardt, Walter L., 4,479,117, Cl. 340-644.000.
Offutt, Warren B.; and Hastings, Jerome K., 4,479,162, Cl. 361-210.000.
Peloza, Kirk B., 4,478,365, Cl. 236-38.000.

Ebata, Yoshikazu: *See—*
Hanyu, Susumu; Kasuga, Noboru; Nomota, Reishi; and Ebata, Yoshikazu, 4,478,161, Cl. 112-155.000.

Edamura, Mizuo; Kajikawa, Takashi; and Okamoto, Koji, to Kawasaki Jukogyo Kabushiki Kaisha. Sputtering system. 4,478,703, Cl. 204-298.000.

Edinger, William J. Self-contained containment for gas cylinder. 4,478,345, Cl. 220-85.00P.

Eertink, Bastiaan B. B.; and Leppink, Arie, to Oce-Nederland B.V. Position control for recycled originals in a copying apparatus. 4,478,405, Cl. 271-227.000.

Eggert, Walter S., Jr. Resilient steering control assembly. 4,478,153, Cl. 105-168.000.

Eguchi, Osamu: *See—*
Fukui, Tomonori; and Eguchi, Osamu, 4,478,049, Cl. 62-179.000.

Eheim, Franz, to Robert Bosch GmbH. Adjustable hydraulically operated stop. 4,478,188, Cl. 123-450.000.

Eian, Gilbert L.; and Trend, John E., to Minnesota Mining and Manufacturing Company. Photolabile blocked surfactants and compositions containing the same. 4,478,967, Cl. 524-86.000.

Eichler, Jurgen: *See—*
Eidenschink, Rudolf; Eichler, Jurgen; and Weber, Georg, 4,478,740, Cl. 252-299.620.

Eickmann, Karl. Arrangement on members which oscillate or pivot. 4,478,133, Cl. 91-488.000.

Eidenschink, Rudolf; Eichler, Jurgen; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Benzonitriles. 4,478,740, Cl. 252-299.620.

Ekoeg Industries, Inc.: *See—*
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,478,026, Cl. 56-7.000.

Electronique Marcel Dassault: *See—*
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,249, Cl. 455-208.000.
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,255, Cl. 455-246.000.

Eli Lilly and Company: *See—*
Fleisch, Jerome H.; Marshall, Winston S.; and Cullinan, George J., 4,478,820, Cl. 424-45.000.

Elias, Gilbert N., to Evans Rotork, Inc. Round edge former. 4,478,664, Cl. 156-216.000.

Elkins, Hubert L.: *See—*
Hynes, Joseph H.; and Elkins, Hubert L., 4,478,287, Cl. 166-341.000.

Elliott, William G. Capacitatively coupled plasma device. 4,479,075, Cl. 315-111.210.

Ellis, John F.: *See—*
Evans, Dennis W.; and Ellis, John F., 4,478,521, Cl. 368-8.000.

Ellis, Thomas E.: *See—*
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., 4,479,034, Cl. 179-18.0ES.

Ellis, Thomas J., to Southco, Inc. Tamper-resistant fastener key. 4,478,115, Cl. 81-436.000.

Elliston, Thomas L., to Hydra-Rig, Incorporated. Hydraulic intensifier. 4,478,561, Cl. 417-400.000.

Elorriaga, Peter, Jr., to Best Industries, Inc. Swivel joint. 4,478,438, Cl. 285-276.000.

Elring Dichtungswerke GmbH: *See—*
Sommer, Horst; and Gronle, Hansgeorg, 4,478,887, Cl. 427-211.000.

Embree, Milton L., to AT&T Bell Laboratories. AC/DC Current divider circuit. 4,479,066, Cl. 307-350.000.

Emhart Industries, Inc.: *See—*
Lambert, Scott M., 4,478,630, Cl. 65-242.000.

Endo, Gen; Hori, Hirokazu; Kawada, Yoshihiro; and Sakai, Junzo, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method of extruding and shaping thermoplastic material. 4,478,775, Cl. 264-40.300.

Energy Conversion Devices, Inc.: *See—*
Doehler, Joachim, 4,478,173, Cl. 118-688.000.

Eneroil Research Ltd.: *See—*
Smith, Robert W., 4,478,158, Cl. 110-215.000.

Engelhard, Philippe: *See—*
Marty, Claude; and Engelhard, Philippe, 4,479,023, Cl. 585-312.000.

Engelhardt & Forster KG: *See—*
Grunewald, Heinz, 4,478,060, Cl. 68-27.000.

Enggist, Paul: *See—*
Demole, Edouard P.; and Enggist, Paul, 4,478,865, Cl. 426-535.000.

English, Thomas A., to Interior Security Corp. Interior security window panel. 4,478,002, Cl. 49-57.000.

Enix, Clayton L., to Weyerhaeuser Company. Side mounted soil ripping mechanism. 4,478,289, Cl. 172-136.000.

Entenmann, Robert: *See—*
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; Schramm, Herbert; and Viess, Walter, 4,478,068, Cl. 73-35.000.

Enviro-Spray Systems, Inc.: *See—*
Magid, David J., 4,478,044, Cl. 60-721.000.

Ergas, Raymond A., to Chevron Research Company. Method of editing seismic traces, as say gathered by large multichannel collection systems. 4,479,183, Cl. 364-421.000.

Erickson, Stanton J. Artificial fishing lures. 4,477,994, Cl. 43-42.440.

Erlandson, Paul M.: *See—*
Hekal, Ihab M.; and Erlandson, Paul M., 4,478,860, Cl. 426-267.000.

Ernest, Robert O.: *See—*
Khaja, Farees U.; Ernest, Robert O.; Gronwick, Jerry P.; and Bristol, Howard A., 4,479,047, Cl. 219-225.000.

Ernst, Donald M., to Thermacore, Inc. Abrasion resistant heat pipe. 4,478,275, Cl. 165-133.000.

Erwin, Timothy R., to Pitney Bowes Inc. Postage meter security seal. 4,478,443, Cl. 292-307.00R.

Escher Wyss GmbH: *See—*
Kochndorfer, Michael; Kurtz, Rudiger; Meurer, Werner; Seider, Werner; and Storr, Helmut, 4,478,684, Cl. 162-337.000.

Essex Chemical Corporation: *See—*
Roggenburg, Stanley L., Jr.; and Laauwe, Robert H., 4,478,356, Cl. 222-94.000.

ETA S.A., Fabriques d'Ebauches: *See—*
Ammann, Ernst, 4,478,522, Cl. 368-37.000.

Ethicon, Inc.: *See—*
Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, 4,478,220, Cl. 128-326.000.
Mericle, Robert W., 4,478,218, Cl. 128-325.000.

Ethyl Corporation: *See—*
Marlett, Everett M., 4,478,813, Cl. 423-644.000.

Ethyl Molded Products Company: *See—*
Ostrowsky, Efrem M., 4,478,343, Cl. 215-252.000.

Ettinger, Robert H.; and Pasko, Walter J., to General Electric Company. Transformer core having charge dissipation facility. 4,479,104, Cl. 336-219.000.

Euclid, Inc.: *See—*
Hayden, Ronald D., 4,478,318, Cl. 188-72.400.

Eumurian, Gregoire; and Gadrault, Robert, to Thomson-CSF. Multiple-threshold optical receiver for a variable-rate digital data transmission system. 4,479,266, Cl. 455-608.000.

Evans, Dennis W.; and Ellis, John F., to Perfection Electronic Products Corp. Digital time meter. 4,478,521, Cl. 368-8.000.

Evans, Robert F. Tuned support for cutting elements in a drag bit. 4,478,295, Cl. 175-56.000.

Evans Rotork, Inc.: *See—*
Elias, Gilbert N., 4,478,664, Cl. 156-216.000.

Everett, James W., to KRW Energy Systems Inc. Erosion resistant elbow for solids conveyance. 4,478,253, Cl. 138-140.000.

Ewald, Roland: *See—*
Lukasczyk, Wolfgang; and Ewald, Roland, 4,478,250, Cl. 137-625.650.

Ewing, John G. Heart monitor for horses. 4,478,225, Cl. 128-706.000.

Exxon Research & Engineering Co.: *See—*
Cohen, Abraham D., 4,478,706, Cl. 208-138.000.
Huff, Terrence, 4,478,951, Cl. 502-108.000.
Lewis, Arthur M.; and Scudo, Aldo, 4,479,136, Cl. 346-140.00R.
Turner, S. Richard; Walker, Thad O.; and Thaler, Warren A., 4,478,727, Cl. 252-8.50C.

Ezzell, Bobby R.; Carl, William P.; and Mod, William A., to Dow Chemical Company, The. Sulfonic acid electrolytic cell membranes and use thereof in the electrolysis of sodium chloride. 4,478,695, Cl. 204-98.000.

Fabian, Rainer, to Linde Aktiengesellschaft. Process for the extraction of carbon monoxide from gas streams. 4,478,621, Cl. 62-31.000.

Faiks, Frederick S., to Steelcase Inc. Weight-actuated chair control. 4,478,454, Cl. 297-316.000.

Failla, Steven: *See—*
Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, 4,478,220, Cl. 128-326.000.

Fairchild, James L.: *See—*
Puri, Avinash D.; Rodosevich, James B.; and Fairchild, James L., 4,478,599, Cl. 23-300.000.

Falconer, David D., to AT&T Bell Laboratories. Digital frequency-shift keyed demodulator. 4,479,092, Cl. 329-145.000.

Falk, Helmut: *See—*
Hebert, Donald G., 4,478,528, Cl. 400-124.000.

Fanelli, Anthony J.; and Price, Alson K., to Allied Corporation. Alumina-based aerogel supported transition metal catalyst useful as a Ziegler-Natta olefin polymerization catalyst and process for preparing same. 4,478,987, Cl. 526-97.000.

Farb, David L.: *See—*
Landaburu, Ricardo H.; Yue, Robert H.; Farb, David L.; and Violand, Bernard N., 4,478,829, Cl. 424-177.000.

Farnsworth, Carl D. Method and apparatus for separating fluidized solid particles suspended in gasiform material. 4,478,708, Cl. 208-161.000.

Fata Industriale S.p.A.: *See—*
Selli, Marino, 4,478,572, Cl. 432-13.000.

Faupel, Werner: *See—*
Dorenkamp, Richard; Faupel, Werner; Geyer, Gerhard; and Jager, Erich, 4,478,195, Cl. 123-502.000.

Fellmann, Jere D.: *See—*
Langer, Horst G.; and Fellmann, Jere D., 4,478,805, Cl. 423-311.000.

Felsen, Marvin: *See—*
Poss, Eliasz; and Felsen, Marvin, 4,478,915, Cl. 428-607.000.

Fenk, Josef, to Siemens Aktiengesellschaft. Transistor oscillator circuit. 4,479,259, Cl. 455-318.000.

Fenn, Larry L., to Fenn-Niemann, Inc. Line-measuring fishing bobber. 4,477,995, Cl. 43-43.110.

Fenn-Niemann, Inc.: *See—*
Fenn, Larry L., 4,477,995, Cl. 43-43.110.

Fenne, Ivor, to Lucas Industries. Fuel injection system. 4,478,189, Cl. 123-467.000.

Fentress, Vernon A.; and Comet, Francois, to Raychem Corporation. Fiber optic splice organizer. 4,478,486, Cl. 350-96.200.

Fenwick, Danny L.; and Hopkins, Jon D., to General Electric Company. Pneumatic ball contact switch. 4,479,041, Cl. 200-81.00R.

Ferco S.r.l.: *See*—
Ferri, Beniamino; and Caimi, Giovanni, 4,479,089, Cl. 324-158.00F.

Ferrer, Richard S.; Goldstein, Alan J.; and Nazif, Zaher A., to AT&T Bell Laboratories. Hyperedge entity-relationship data base systems. 4,479,196, Cl. 364-900.000.

Ferri, Beniamino; and Caimi, Giovanni, to Ferco S.r.l. Process and apparatus to check the presence and/or efficiency of microcomponents during the assembling thereof on printed circuit boards. 4,479,089, Cl. 324-158.00F.

Ferrofluidics Corporation: *See*—
Raj, Kuldip, 4,478,424, Cl. 277-80.000.

Feudor S.A.: *See*—
Johansson, Stig, 4,478,570, Cl. 431-344.000.

Fiber Associates, Inc.: *See*—
Geyer, Charles J., Jr.; and White, Ben E., 4,477,951, Cl. 28-246.000.

Fichtel & Sachs AG: *See*—
Weissenberger, Helmut, 4,478,323, Cl. 192-3.300.

Fickes, Michael G.; and Shobert, Alan L., to Du Pont de Nemours, E. I., and Company. Precurled flexographic printing plate. 4,478,931, Cl. 430-309.000.

Figgie International, Inc.: *See*—
Becker, Michael L., 4,478,023, Cl. 53-382.000.

Fine Art Pillow & Specialties Corp.: *See*—
Schutz, Bernard R., 4,478,453, Cl. 297-219.000.

Fineberg, Douglas H., to Baker Oil Tools, Inc. Equalizing valve for subterranean wells. 4,478,286, Cl. 166-324.000.

Finkelstein, Manuel; Dunkl, Franz C.; and Ross, Sidney D., to Sprague Electric Company. High temperature electrolytic capacitor. 4,479,166, Cl. 361-433.000.

Finkelstein, Manuel: *See*—
Ross, Sidney D.; and Finkelstein, Manuel, 4,479,167, Cl. 361-433.000.

Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., to General Motors Corporation. Vehicle body closure latch. 4,478,441, Cl. 292-216.000.

Firestone Tire & Rubber Company, The: *See*—
Precht, Hans, 4,478,672, Cl. 156-421.000.

Firmenich SA: *See*—
Demole, Edouard P.; and Enggist, Paul, 4,478,865, Cl. 426-535.000.
Schulte-Elte, Karl H.; Snowden, Roger L.; and Muller, Bernard L., 4,479,011, Cl. 568-361.000.

Firth, Bruce E., to UOP Inc. Alkylated 5,6,7,8-tetrahydronaphthalenols as antioxidants. 4,478,605, Cl. 44-78.000.

Fischer, Karl; Grenacher, Armin V.; Herr, Manfred; and Strohmeyer, Max, to BASF Aktiengesellschaft. Recovery of aldehydes from hydroformylation reaction gas. 4,479,012, Cl. 568-454.000.

Fischer, Stephen A.: *See*—
Hereda, Maryellen; and Fischer, Stephen A., 4,478,795, Cl. 423-127.000.

Fischer, Wolfgang; Gehre, Gerhard; Korf, Rainer; Lorenz, Renate; and Taschner, Heinz, to VEB Kombinat Medizin- und Laborteschnik Leipzig. Snugly fitting denture and process of its manufacture. 4,478,579, Cl. 433-222.000.

Fisher, John; and Holman, David, to BP Nutrition (UK) Limited. Rearing unit. 4,478,175, Cl. 119-16.000.

Fitko, Chester W., deceased (by Fitko, Clare B., administrator), to Continental Group, Inc., The. Method for effecting heat seals of controlled detachability between propylene polymers and enamel coated surfaces. 4,478,667, Cl. 156-307.300.

Fitko, Clare B., administrator: *See*—
Fitko, Chester W., deceased, 4,478,667, Cl. 156-307.300.

Flakt Aktiebolag: *See*—
Andersson, Karl-Hugo; and Zinn, Nils, 4,477,983, Cl. 34-114.000.

Fleck, Harald: *See*—
Aarts, Petrus J. J.; Fleck, Harald; and Kocsisek, Karl, 4,479,157, Cl. 360-104.000.

Fleisch, Jerome H.; Marshall, Winston S.; and Cullinan, George J., to Eli Lilly and Company. Anilino-substituted isoquinoline quinones, pharmaceutical compositions and method of use thereof. 4,478,820, Cl. 424-45.000.

Fleischmann, Gary A., to Kohler Co. Fluid control valve. 4,478,249, Cl. 137-625.400.

Fleisher, Larry D., to Minnesota Mining and Manufacturing Company. Electrical wire connector holder. 4,478,477, Cl. 339-198.00G.

Fletcher, Aaron N., to United States of America, Navy. Adaptation for improving lifetime of dye laser using coumarin dyes. 4,479,223, Cl. 372-53.000.

Fletcher, James; and Wooding, Michael S., to British Aerospace Public Limited Company. Aircraft. 4,478,377, Cl. 244-12.500.

Flett, Dennis E. Interior insulating window system. 4,478,003, Cl. 49-63.000.

Flexman, C. Hight, to McGard, Inc. Locking and anti-loosening construction for vehicle rim. 4,478,458, Cl. 301-9.0SC.

Flood, Steven P., to Motorola, Inc. Dual audio capture limiter squelch circuit. 4,479,250, Cl. 455-213.000.

Fluidyne Corporation: *See*—
Yie, Gene G., 4,478,368, Cl. 239-430.000.

Flum, Paul, to Paul Flum Ideas, Inc. Adjustable shelving unit. 4,478,337, Cl. 211-49.00D.

Flynn, Richard M.: *See*—
Burton, Donald J.; and Flynn, Richard M., 4,478,761, Cl. 260-970.000.

FMC Corporation: *See*—
Poock, Darwin N.; and Volkmann, Thomas J., 4,478,014, Cl. 52-115.000.

Fogg, M. Charles; Krieger, Charles F.; and Veale, John R., to Computer Election Systems. System and method for reading marks on a document. 4,479,194, Cl. 364-900.000.

Fogg, O. Douglas: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,479,197, Cl. 364-900.000.

Fogg, Ralph L.: *See*—
Schroeder, Clifford A.; and Fogg, Ralph L., 4,478,657, Cl. 156-64.000.

Folkmar, Jan: *See*—
Mikkelsen, Henrik, 4,478,386, Cl. 249-83.000.

Folli, Giulio; and Casadei, Marino, to Folli Giulio & Dante, di Folli Giulio, Folli Renzo & Preti Fosca s.n.c. Machine for forming unbroken rings, or similar, of dough out of strips of moistened and kneaded flour. 4,478,568, Cl. 425-320.000.

Folli Giulio & Dante, di Folli Giulio, Folli Benzo & Preti Fosca s.n.c.: *See*—
Giulio, Folli; and Marino, Casadei, 4,478,569, Cl. 425-324.100.

Folli Giulio & Dante, di Folli Giulio, Folli Renzo & Preti Fosca s.n.c.: *See*—
Folli, Giulio; and Casadei, Marino, 4,478,568, Cl. 425-320.000.

Ford Motor Company: *See*—
Asik, Joseph R., 4,478,201, Cl. 123-620.000.

Forrester, John S., to Lucas Industries. Load monitoring arrangement for a vehicle axle. 4,478,091, Cl. 73-862.540.

Foslien, Floyd L., to Minnesota Mining and Manufacturing Company. Stapler cartridge with angularly disposed staple guide track portions. 4,478,362, Cl. 227-19.000.

Foster, Craig A.: *See*—
Bridges, William G.; and Foster, Craig A., 4,478,170, Cl. 118-64.000.
Bridges, William G.; and Foster, Craig A., 4,478,171, Cl. 118-64.000.

Foster-Miller, Inc.: *See*—
Lusignea, Richard W.; Kirby, George J.; and Mariano, Charles F., 4,477,977, Cl. 33-178.00R.

Foust, Harry D.: *See*—
Friedman, Irwin R.; Foust, Harry D.; and Butt, Alan G., 4,478,277, Cl. 165-185.000.

Fowks, William R., to Rockwell International Corporation. Voltage variable crystal controlled oscillator. 4,479,096, Cl. 331-3.000.

Fox, Albert D.: *See*—
Knight, Donn C.; Kish, Robert J.; and Fox, Albert D., 4,478,390, Cl. 254-270.000.

Fox, Jay B., Jr., to United States of America, Agriculture. Method of making stable emulsified meat products. 4,478,859, Cl. 426-266.000.

Fox, Preston R.: *See*—
Wells, Lawrence E.; Kamenster, Boris; Fox, Preston R.; and Gill, Jerry A., 4,478,111, Cl. 81-57.190.

Fraioli, Donato M., to Air Structures International, Inc. Cabling system for an inflatable building. 4,478,012, Cl. 52-2.000.

Frakes, James F. Wing tip vortices suppressor. 4,478,380, Cl. 244-199.000.

Franco, Robert S.; and Weiner, Murray. Method for altering red blood cell function and survival. 4,478,824, Cl. 424-101.000.

Frank Mayer & Associates, Inc.: *See*—
Crosslen, Louis J., 4,478,338, Cl. 211-490.000.

Frater, Norman K.; Hoo, Stanley S.; and McConnell, William H., to International Business Machines Corporation. Circuitry for measuring magnetic head flying characteristics. 4,479,090, Cl. 324-454.000.

Frear, David L., to Bendix Corporation, The. Coupling nut for an electrical connector. 4,478,473, Cl. 339-89.00M.

Fredin, Bo: *See*—
Andersson, Ingmar; Borrman, Bo; Fredin, Bo; and Nylund, Olov, 4,478,786, Cl. 376-444.000.

Freedman, Harold H., to Dow Chemical Company, The. Process for crosslinking polyamines. 4,478,938, Cl. 435-181.000.

Freeman, James D. Roller-type liquid-adhesive applicator. 4,478,671, Cl. 156-391.000.

Freeman, Lewis O.: *See*—
Skinner, David R.; Stokes, Rex A.; Freeman, Lewis O.; and McNeill, Alan R., 4,478,513, Cl. 356-323.000.

French, Ernest. Tire deflation warning device. 4,479,109, Cl. 340-58.000.

Freytag, Adolf: *See*—
Misch, Wolfgang; Freytag, Adolf; and Henning, Manfred, 4,478,183, Cl. 123-339.000.

Frick, Nikolaus: *See*—
Weilenmann, Walter; Frick, Nikolaus; and Hirt, Peter, 4,478,293, Cl. 173-162.00R.

Friedlander, Marc A.; and Meth, Sheldon Z. Information storage system using a photon echo medium. 4,479,199, Cl. 365-119.000.

Friedman, Irwin R.; Foust, Harry D.; and Butt, Alan G., to Trane Company, The. Heat exchanger having uniform surface temperature and improved structural strength. 4,478,277, Cl. 165-185.000.

Frigoscandia Contracting AB: *See*—
Svensson, Sten-Eric; and Andersson, Gustaf A., 4,478,141, Cl. 99-476.000.

Frische, Richard H.; Dankwort, Rudolf C.; and Klem, Charles D., to Sperry Corporation. Vibrating quartz diaphragm pressure sensor. 4,479,070, Cl. 310-338.000.

Froehlich, Frederick B., and Hu, Paul Y., to International Business Machines Corporation. Stationary magnetic head with a fluid operated tape lifter. 4,479,158, Cl. 360-130.100.

Frontier Electronics, Inc.: *See—*
Cochran, John M., Jr.; and Cleveland, Ronald N., 4,478,301, Cl. 177-70.000.

Frost, Walter W.: *See—*
Mitchell, William O.; Frost, Walter W.; and Hamilton, C. Ray, 4,478,359, Cl. 223-002.000.

Frosta Fritid AB: *See—*
Mattsson, Stig, 4,477,929, Cl. 2-425.000.

Fruchard, Charles; and Joly, Jean C., to AMP Incorporated. Electrical contact. 4,478,470, Cl. 339-74.00R.

Fryxell, Robert E.: *See—*
Smith, Murray S., Jr.; Perkins, Roger J.; Fryxell, Robert E.; and Young, William R., 4,478,638, Cl. 75-255.000.

Fuji Photo Film Co., Ltd.: *See—*
Abe, Akira, 4,478,943, Cl. 436-80.000.
Ikeda, Kensuke; and Igarashi, Akira, 4,479,138, Cl. 346-207.000.
Katsuyama, Harumi; Amano, Yoshikazu; and Kondo, Asaji, 4,478,942, Cl. 436-66.000.
Mizuno, Chiaki; and Tamai, Yasuo, 4,478,908, Cl. 428-327.000.
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; and Sato, Kozo, 4,478,927, Cl. 430-203.000.
Sakaguchi, Masaaki; Satoh, Shinichi; Kiuchi, Seiji; and Chikamasa, Hiroshi, 4,478,376, Cl. 242-191.000.
Shiba, Keisuke; Nakao, Sho; and Koizumi, Shigeo, 4,478,930, Cl. 430-271.000.
Shiozawa, Etuo; Ohnishi, Masahiro; and Harada, Shigeo, 4,479,133, Cl. 346-108.000.

Fuji Photo Optical Co., Ltd.: *See—*
Asano, Sheiji, 4,478,212, Cl. 128-6.000.

Fuji Xerox Co., Ltd.: *See—*
Kurata, Masami, 4,479,242, Cl. 382-17.000.

Fujii, Haruo; and Ando, Yujiro, to Canon Kabushiki Kaisha. Cleaning device for modulation control means. 4,478,510, Cl. 355-15.000.

Fujii, Norio: *See—*
Azuma, Toru; Hazama, Junji; Kawahara, Atsushi; Hada, Kazunari; and Fujii, Norio, 4,479,145, Cl. 358-106.000.

Fujikawa, Takao: *See—*
Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, 4,478,626, Cl. 65-18.100.

Fujikawa, Tetsuzo; and Takada, Toshiyuki, to Kawasaki Jukogyo Kabushiki Kaisha. Crankchamber precompression type two-cycle internal combustion engine. 4,478,180, Cl. 123-59.0BS.

Fujimoto, Kaoru: *See—*
Tominaga, Hiroo; Fujimoto, Kaoru; and Shikada, Tsutomu, 4,478,801, Cl. 423-235.000.

Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, to Hitachi, Ltd. Fuel cell. 4,478,917, Cl. 429-33.000.

Fujita, Kouichi, to Fujitsu Limited. Output buffer circuit. 4,479,067, Cl. 307-475.000.

Fujitsu Limited: *See—*
Fujita, Kouichi, 4,479,067, Cl. 307-475.000.
Higuchi, Mitsuo; and Arakawa, Hideki, 4,479,126, Cl. 340-825.860.
Kato, Akinori; and Chujo, Yoshihiro, 4,478,508, Cl. 355-14.00R.
Sato, Masashi; and Sugo, Yasuhisa, 4,479,200, Cl. 365-175.000.

Fujiyama, Yoshiko: *See—*
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,478,956, Cl. 521-32.000.

Fukaya, Masaki: *See—*
Yoshioka, Seishiro; Hirai, Yutaka; Fukuda, Tadaji; Fukaya, Masaki; and Nakagiri, Takashi, 4,479,149, Cl. 358-294.000.

Fukuda, Tadaji: *See—*
Yoshioka, Seishiro; Hirai, Yutaka; Fukuda, Tadaji; Fukaya, Masaki; and Nakagiri, Takashi, 4,479,149, Cl. 358-294.000.

Fukui, Isao: *See—*
Ogawa, Yasuhiro; and Fukui, Isao, 4,479,084, Cl. 323-210.000.

Fukui, Tomonori; and Eguchi, Osamu, to Nippondenso Co., Ltd. Air-conditioning control for a motor vehicle. 4,478,049, Cl. 62-179.000.

Fukumitsu, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for reproducing signals recorded on a disk. 4,479,209, Cl. 369-77.200.

Fuller, Robert L., to Kopecko, William J.; and Duchac, Joseph O., part interest to each. Belt drive for machine for resurfacing vehicle brake discs. 4,478,116, Cl. 82-4.00A.

Funada, Fumiaki: *See—*
Nakagawa, Kenichi; Minezaki, Shigehiro; and Funada, Fumiaki, 4,478,741, Cl. 252-299.630.

Furukawa, Hiroyasu: *See—*
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,478,982, Cl. 525-316.000.

Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., to University of Dayton. Production of diffraction limited holographic images. 4,478,481, Cl. 350-3.830.

Futros, Ernest M., to Canadian Drilling Equipment Ltd. Drilling rig. 4,478,291, Cl. 173-147.000.

Fuzii, Koichiro, to Nisshin Steel Co., Ltd.; and Kurosaki Refractories Co., Ltd. Method for preventing the inclusion of slag into the molten steel taped from a converter. 4,478,392, Cl. 266-44.000.

G & W Electric Company: *See—*
Banes, Alexander J., 4,479,105, Cl. 337-4.000.

Gabano, Jean-Paul; and Duchange, Jean-Pierre, to GIPELEC. Lithium cell having a solid electrolyte constituted by a conductive vitreous compound. 4,478,920, Cl. 429-191.000.

Gacek, Mikkel: *See—*
Benneche, Tore; Gacek, Mikkel; and Undheim, Kjell, 4,478,839, Cl. 424-251.000.

Gadient, Fulvio, to Sandoz Ltd. 1-Phenyl-azepinoindoles. 4,478,750, Cl. 260-245.700.

GADOT, Petrochemical Industries, Ltd.: *See—*
Sasson, Yoel; and Zbaida, Shmuel, 4,479,015, Cl. 568-584.000.

Gadrault, Robert: *See—*
Eumurian, Gregoire; and Gadrault, Robert, 4,479,266, Cl. 455-608.000.

Gakko Hojin Kinki Daigaku: *See—*
Kuwahara, Tosihide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, 4,478,643, Cl. 106-288.00Q.

Galand, Claude; and Nussbaumer, Henri, to International Business Machines Corporation. Transmission method for transmitting voice and data information over telephone line and device for implementing said method. 4,479,213, Cl. 370-118.000.

Gale, Robert M.: *See—*
Shell, John W.; and Gale, Robert M., 4,478,818, Cl. 424-14.000.

Galletti, Cesare: *See—*
Gancia, Emanuele; and Galletti, Cesare, 4,478,065, Cl. 72-239.000.

Gallusser, David O.; and Peterson, Ann E., to Bendix Corporation, The. Coupling nut for an electrical connector. 4,478,474, Cl. 339-89.00M.

Gancia, Emanuele; and Galletti, Cesare, to Innse Innocenti Santeustacchio S.p.A. Continuous rolling mill with crossed stands for the production of seamless tubes. 4,478,065, Cl. 72-239.000.

Ganguli, Partha S., to HRI, Inc. Hydroconversion process for hydrocarbon liquids using supercritical vapor extraction of liquid fractions. 4,478,705, Cl. 208-59.000.

Garavuso, Gerald M., to Xerox Corporation. Pneumatic extension bottom stacking. 4,478,404, Cl. 271-212.000.

Garrett Corporation, The: *See—*
Kobayashi, Robert J.; and Byrne, Joe L., 4,478,043, Cl. 60-608.000.

Garrett, William L. Synthetic seaweed. 4,478,533, Cl. 405-24.000.

Garrett, William R. Mud saver valve. 4,478,244, Cl. 137-515.000.

Garten, Robert L.: *See—*
Bruylants, Philippe M.; and Garten, Robert L., 4,479,024, Cl. 585-437.000.

Gass, Karl: *See—*
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,478,635, Cl. 71-92.000.

Gast, Jurgen; Wunsch, Lutz; and Zachmann, Gunter, to Bruker Analytische Messtechnik GmbH. Auxiliary unit for carrying out reflection measurements using an IR spectrometer. 4,479,058, Cl. 250-343.000.

Gau, George, to Krones AG Hermann Kronseder Maschinenfabrik. Labeling machine. 4,478,668, Cl. 156-364.000.

Gau, Shek-Chung; and Dalal, Vikram L., to Chronar Corporation. Amorphous silicon carbide method. 4,478,654, Cl. 148-174.000.

Gaucher, Antoine, to Centre Stephanois De Recherches Mecaniques Hydromecanique Et Frottement Zone Industrielle. Aqueous lubricating composition and process of manufacturing same. 4,478,731, Cl. 252-36.000.

Gaugel, Manfred; and Schonherr, Walter, to Patent Truehand-Gesellschaft fur elektrische Gluhlampen mbH. Sealed-beam headlamp having seating abutment on the outside of concave reflector. 4,479,072, Cl. 313-113.000.

Gauzza, Harry J.: *See—*
Applebaum, Albert; Will, Albert S.; Humphrey, Samuel A.; McLean, Frank C.; Wolf, Sylvan; Peterson, Carl R.; Gauzza, Harry J.; and Hetzler, John C., 4,478,148, Cl. 102-390.000.

Gayer, Melvin D., to Dayco Corporation. Belt tensioning means. 4,478,594, Cl. 474-50.000.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Lanfermann, Willy, 4,478,457, Cl. 299-18.000.

Gebr. Klocker (Klocker Bros.): *See—*
Klocker, Heinz, 4,478,256, Cl. 139-54.000.

Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., to Electronique Marcel Dassault; and Centre National d'Etudes Spatiales. Apparatus for collecting and processing messages transmitted at different signal frequencies. 4,479,249, Cl. 455-208.000.

Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., to Electronique Marcel Dassault; and Centre National d'Etudes Spatiales. Apparatus for acquiring and collecting radio signals coming from a plurality of stations. 4,479,255, Cl. 455-246.000.

Gehre, Gerhard: *See—*
Fischer, Wolfgang; Gehre, Gerhard; Korf, Rainer; Lorenz, Renate; and Taschner, Heinz, 4,478,579, Cl. 433-222.000.

Geiger, Rolf: *See—*
Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Mullner, Hubert, 4,478,828, Cl. 424-177.000.

Gelus, Maurice: *See—*
Berger, Pierre; and Gelus, Maurice, 4,478,644, Cl. 127-1.000.

Gendler, Paul L.; and Twieg, Robert J., to International Business Machines Corporation. Phenazine leucodyes for electrochromic recording. 4,478,687, Cl. 204-2.000.

General Electric Company: *See—*
Abolins, Visvaldis; Axelrod, Robert J.; and Shu, Peter H., 4,478,970, Cl. 524-125.000.
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,478,979, Cl. 525-68.000.
Baker, Lewin T., 4,479,215, Cl. 371-33.000.
Chung, Rack H., 4,478,876, Cl. 427-54.100.

Cole, Herbert S., Jr., 4,479,118, Cl. 340-663.000.
Crescenzi, Robert J.; Daniels, John U., Jr.; and Roberts, Gerald E., 4,477,952, Cl. 29-25.350.
Dills, Raymond L., 4,478,048, Cl. 62-126.000.
Ettinger, Robert H.; and Pasko, Walter J., 4,479,104, Cl. 336-219.000.
Fenwick, Danny L.; and Hopkins, Jon D., 4,479,041, Cl. 200-81.00R.
Harris, Samuel C., 4,479,081, Cl. 318-696.000.
Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., 4,478,791, Cl. 420-590.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,478,785, Cl. 264-65.000.
Keane, John J.; and Zopf, Richard F., 4,478,932, Cl. 430-314.000.
Kim, Wontaik, 4,478,780, Cl. 264-328.200.
Kuwata, Masayoshi; and Urbaetis, Stanley P., 4,478,646, Cl. 134-7.000.
Lambert, Joe C., 4,479,080, Cl. 318-373.000.
Mundschenk, Glenn R., 4,478,005, Cl. 49-388.000.
Pauze, Denis R., 4,478,913, Cl. 428-383.000.
Rabatin, Jacob G., 4,478,933, Cl. 430-496.000.
Smith, Murray S., Jr.; Perkins, Roger J.; Fryxell, Robert E.; and Young, William R., 4,478,638, Cl. 75-255.000.
Yates, Roy K., 4,478,059, Cl. 68-17.00A.

General Electric Company p.l.c., The: *See*—
Schauder, Colin D.; and Caddy, Roy, 4,479,082, Cl. 318-799.000.

General Foods Corporation: *See*—
Zobel, Frederick A.; Burke, Joseph D.; and Oppy, John T., 4,478,867, Cl. 426-570.000.

General Hospital Corporation, The: *See*—
Haber, Edgar; and Burton, James, 4,478,827, Cl. 424-177.000.

General Motors Corporation: *See*—
Bly, Kenneth B.; Chmiel, Edward J.; and Martyniuk, Ernest T., 4,478,618, Cl. 55-314.000.
Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., 4,478,441, Cl. 292-216.000.

General Partitions Mfg. Corp.: *See*—
Thompson, William A., Jr., 4,478,019, Cl. 52-239.000.

General Signal Corporation: *See*—
Mergner, George C., 4,478,527, Cl. 374-172.000.

Genetics International, Inc.: *See*—
Crawford, Don L.; and Pometto, Anthony L., III, 4,478,747, Cl. 435-72.000.

Gentile, Anthony J.: *See*—
Cropper, George D.; and Gentile, Anthony J., 4,478,038, Cl. 60-39.020.

Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; and Wada, William T., to Mobil Oil Corporation. Buoyed moonpool plug for disconnecting a flexible flowline from a process vessel. 4,478,586, Cl. 441-4.000.

Geoffrey Greethead Pty. Limited: *See*—
Greethead, Geoffrey F., 4,478,862, Cl. 426-450.000.

George, John A., to Xomox Corporation. Plug valve with removable lip insert means. 4,478,388, Cl. 251-309.000.

Georgetown University: *See*—
Ledley, Robert S.; and Zapolski, Edward J., 4,478,816, Cl. 424-4.000.

Geosource Inc.: *See*—
Lockett, James F.; Janecka, Jerry F.; and Mehrkam, Thomas O., 4,479,264, Cl. 455-605.000.

Gergoe, Bela: *See*—
Fiordellisi, Stephen J.; Gergoe, Bela; and Hamilton, John W., 4,478,441, Cl. 292-216.000.

Gerhold, Clarence G., to UOP Inc. High efficiency continuous separation process. 4,478,721, Cl. 210-659.000.

Gerrish, Howard W., Jr.: *See*—
Vetter, Ronald F.; Gerrish, Howard W., Jr.; and Lesniak, Lawrence F., 4,478,151, Cl. 102-481.000.

Geus, John W.: *See*—
van der Wal, Willem J. J.; and Geus, John W., 4,478,800, Cl. 423-230.000.

Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Inc. Viscose rayon spinning machine. 4,477,951, Cl. 28-246.000.

Geyer, Gerhard: *See*—
Dorenkamp, Richard; Faupel, Werner; Geyer, Gerhard; and Jager, Erich, 4,478,195, Cl. 123-502.000.

Geze GmbH: *See*—
Scheck, Georg, 4,478,426, Cl. 280-625.000.

Gibello, Carlo. Tennis racquet with offset, oval-shaped head. 4,478,416, Cl. 273-73.00C.

Gibson, James D., to Hercules Incorporated. Urethane compounds and CMDB propellants stabilized therewith. 4,478,656, Cl. 149-19.400.

Gieschen, John A., to Rexnord Inc. Conical crusher. 4,478,373, Cl. 241-208.000.

Giese, Roger W. Process for applying multiple layers of a protein and a ligand extender to a surface and to the multiple-layer system. 4,478,914, Cl. 428-407.000.

Giglia, Robert D.: *See*—
Huang, Sun Y.; and Giglia, Robert D., 4,478,991, Cl. 526-287.000.

Gill, Jerry A.: *See*—
Wells, Lawrence E.; Kamenster, Boris; Fox, Preston R.; and Gill, Jerry A., 4,478,111, Cl. 81-57.190.

Gille, Robert A.; Planer, Norman G.; and Zansky, Zoltan, to Honeywell Inc. Phase modulated switchmode power amplifier and waveform generator. 4,479,175, Cl. 363-41.000.

Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Anode for magnetic sputtering apparatus. 4,478,702, Cl. 204-298.000.

Gillette Company, The: *See*—
Carrillo, Angel L., 4,478,821, Cl. 424-47.000.

Gilliams, Yvan K.: *See*—
De Roo, Pierre R.; Gilliams, Yvan K.; and Van Gijsel, Francine, 4,478,923, Cl. 430-110.000.

GIPELEC: *See*—
Gabano, Jean-Paul; and Duchange, Jean-Pierre, 4,478,920, Cl. 429-191.000.

Girot, Pierre; and Boschetti, Egisto, to Pharmuka Laboratoires. Automatic installation for liquid chromatography. 4,478,713, Cl. 210-101.000.

Giulio, Folli; and Marino, Casadei, to Folli Giulio & Dante, di Folli Giulio, Folli Benzo & Preti Fosca s.n.c. Machine for forming unbroken rings of dough. 4,478,569, Cl. 425-324.100.

Glaenzer Spicer: *See*—
Mangiavacchi, Jacques, 4,478,591, Cl. 464-14.000.

Global Nutrameal, Inc.: *See*—
Stauss, Kirk B., 4,478,857, Cl. 426-72.000.

Glorie, Maurice: *See*—
Souchay, Philippe; and Glorie, Maurice, 4,479,252, Cl. 455-223.000.

Goda, Wilfried, to Precitronic Gesellschaft fur Feinmechanik und Electronics mbH. Method and apparatus for shooting simulation of ballistic ammunition with movable targets. 4,478,581, Cl. 434-22.000.

Godejahn, Gordon C., Jr., to Rockwell International Corporation. Process for and structure of high density VLSI circuits, having self-aligned gates and contacts for FET devices and conducting lines. 4,477,962, Cl. 29-571.000.

Godo Seitetsu Kabushiki Kaisha: *See*—
Okuno, Ryuzo; Toyoda, Keio; Sarai, Masahiro; and Takai, Kiyoshi, 4,478,574, Cl. 432-180.000.

Goertz, Hans-Helmut; Marcinowski, Stefan; and Sanner, Axel, to BASF Aktiengesellschaft. Water-insoluble protein material, its preparation and its use. 4,478,976, Cl. 525-54.100.

Goldstein, Alan J.: *See*—
Ferrer, Richard S.; Goldstein, Alan J.; and Nazif, Zaher A., 4,479,196, Cl. 364-900.000.

Goller, Ernst: *See*—
Kazmaier, Gunther; and Goller, Ernst, 4,478,058, Cl. 66-149.00R.

Good, Jeremy A.: *See*—
Cohen, Enrico; and Good, Jeremy A., 4,478,711, Cl. 209-39.000.

Goodall, Brian L.; and van der Linden-Lemmers, Wilhelmina J. M., to Shell Oil Company. Process for the stereospecific polymerization of an alpha olefin and an alpha olefin polymerization catalyst system. 4,478,989, Cl. 526-142.000.

Goodall, Charles C. O.: *See*—
Blake, Colin C.; Goodall, Charles C. O.; and Bacon, Paul A., 4,478,714, Cl. 210-136.000.

Goodnight, Lyman E., Jr., to Milton Roy Company. Column retainer. 4,478,715, Cl. 210-198.200.

Goodyear Tire & Rubber Company, The: *See*—
Lal, Joginder; and Sandstrom, Paul H., 4,478,980, Cl. 525-187.000.
Parker, Dane K., 4,478,983, Cl. 525-332.200.
Pierson, Robert M.; Haas, Edward J.; and Montgomery, Edward C., 4,478,266, Cl. 152-209.00R.
Wideman, Lawson G.; and Sandstrom, Paul H., 4,478,993, Cl. 527-600.000.

Goossens, John C.: *See*—
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,478,979, Cl. 525-68.000.

Gotoh, Masao: *See*—
Tsuzuku, Susumu; Hira, Yasuo; Gotoh, Masao; Yokono, Hitoshi; and Hosoe, Yoshihisa, 4,478,902, Cl. 428-174.000.

Gotting, Otto: *See*—
Hess, Walter; Nicolai, Franz; Treiss, Erich; and Gotting, Otto, 4,479,043, Cl. 219-8.500.

Goudsche Machinefabriek B.V.: *See*—
van der Schoot, Peter W. C., 4,478,863, Cl. 426-482.000.

Gozzi, Antonio. Three or four stage gas compressor. 4,478,556, Cl. 417-256.000.

Gradco Systems, Inc.: *See*—
DuBois, R. Clark, 4,478,406, Cl. 271-293.000.

Graff, Paul, to N.F.A. Corp. Elastic with embedded pull cord. 4,477,928, Cl. 2-221.000.

Graham, Anne M.: *See*—
Pesa, Frederick A.; and Graham, Anne M., 4,478,955, Cl. 518-713.000.

Gram, Martin M., to MTS Systems Corporation. Load frame crosshead construction. 4,478,086, Cl. 73-781.000.

Granberg, Mauritz L.; and Hanson, David G. Scanning sonar display system. 4,479,206, Cl. 367-104.000.

Graser, Earl J., to Manville Service Corporation. Sleeve style beverage package. 4,478,334, Cl. 206-427.000.

Graves, William L., to AMAX Inc. Trolley bridge. 4,479,037, Cl. 191-36.000.

Gray, Gary A.: *See*—
Daughton, John W.; Gray, Gary A.; Wilczek, Stephen A.; and Steiner, Edward, 4,478,509, Cl. 355-14.00C.

Gray, Roger E.: *See*—
Moghe, Sanjay B.; Gray, Roger E.; and Tsai, Wei, 4,479,100, Cl. 333-33.000.

Gray, William C., to Mobil Oil Corporation. Method of migrating seismic data without dependency on velocity. 4,479,205, Cl. 367-63.000.

Green, Gilbert E., Jr., to Sprague Electric Company. Electrolytic capacitor with a hermetic seal. 4,479,168, Cl. 361-433.000.

Green, Lawrence E.: *See*—
Drevitch, Nolan A.; and Green, Lawrence E., 4,477,991, Cl. 40-158.00B.
Greene, Aubrey E., to Amermac Inc. Wheel adapters for truing and balancing tires. 4,478,081, Cl. 73-487.000.
Greenley, Gordon A.: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,479,197, Cl. 364-900.000.
Greethead, Geoffrey F., to Geoffrey Greethead Pty. Limited. Heat-treatment of cereal. 4,478,862, Cl. 426-450.000.
Gregg, James S., to Samsonite Corporation. Spring loaded luggage case hinge. 4,477,941, Cl. 16-289.000.
Gregory, Jane A.: *See*—
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Grenacher, Armin V.: *See*—
Fischer, Karl; Grenacher, Armin V.; Herr, Manfred; and Strohmeyer, Max, 4,479,012, Cl. 568-454.000.
Griffin, Gordon D. Mattress support system. 4,477,935, Cl. 5-241.000.
Griffin, Robert A.: *See*—
Coleman, Tommy W.; and Griffin, Robert A., 4,478,697, Cl. 204-105.00M.
Griffis, Patrick D., to RCA Corporation. Switching arrangement for a stereophonic sound synthesizer. 4,479,235, Cl. 381-17.000.
Grimshaw, Kenneth P., to Metalogic Control Limited. Adaptive control of a dynamic system or process. 4,479,176, Cl. 364-148.000.
Grisaffi, John J.: *See*—
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Grob & Co. Aktiengesellschaft: *See*—
Koch, Bernhard, 4,478,258, Cl. 139-358.000.
Gronle, Hansgeorg: *See*—
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Gronwick, Jerry P.: *See*—
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Gros, Georges; and Molin, Marc, to Rhone-Poulenc Agrochimie. Process for the preparation of 1-carbamoyl-3-(3,5-dichlorophenyl)-hydantoins. 4,479,006, Cl. 548-312.000.
Gross, Robert C.; and Gross, Susan C., to Eastman Kodak Company. Analytical element containing a barrier zone and process employing same. 4,478,944, Cl. 436-95.000.
Gross, Susan C.: *See*—
Gross, Robert C.; and Gross, Susan C., 4,478,944, Cl. 436-95.000.
Grubbs, Harvey J.: *See*—
Houminer, Yoram; and Grubbs, Harvey J., 4,479,003, Cl. 546-341.000.
Grubka, Lawrence J., to Owens-Corning Fiberglas Corporation. Apparatus for producing and collecting glass fibers. 4,478,625, Cl. 65-11.100.
Grunewald, Heinz, to Engelhardt & Forster KG. Continuous washing machine. 4,478,060, Cl. 68-27.000.
Grush, Robert J., Jr. Bivalve shellfish opening knife. 4,477,943, Cl. 17-75.000.
GTE Laboratories Incorporated: *See*—
Cogan, Adrian I., 4,477,963, Cl. 29-571.000.
GTE Products Corporation: *See*—
Barbano, Normand, 4,479,127, Cl. 343-742.000.
Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., 4,478,888, Cl. 427-220.000.
Kackenmeister, Carl F.; and Houseknecht, Gary L., 4,478,571, Cl. 431-359.000.
Guarnieri, C. Richard. Radiant energy collector having plasma-textured polyimide exposed surface. 4,478,209, Cl. 126-417.000.
Gudat, Wolfgang: *See*—
Liermann, Peter; Hesse, Karl-Heinz; Meyer, Dietmar; and Gudat, Wolfgang, 4,478,131, Cl. 91-356.000.
Gudnason, Geir V., to Coca-Cola Company, The. Process for the purification of sugar syrups. 4,478,645, Cl. 127-57.000.
Guibert, Raul. Automatic paste-producing apparatus. 4,478,519, Cl. 366-157.000.
Gunther, Michael: *See*—
Backstein, Gunter; Unger, Hans W.; Gunther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,478,149, Cl. 102-426.000.
Gurtler, Henrick: *See*—
Alder-Nissen, Jens L.; Gurtler, Henrick; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,940, Cl. 435-209.000.
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Guynes, Kenneth W.: *See*—
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Dukowski, Hubert G., 4,478,216, Cl. 128-204.210.
H. R. Electronics Company: *See*—
Levasseur, Joseph L., 4,478,353, Cl. 221-14.000.
H. Stoll GmbH & Co.: *See*—
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Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, to Hewlett-Packard Company. Method and apparatus for selecting and setting the mode of operation for a mechanism. 4,479,197, Cl. 364-900.000.
Haag, Gottlob: *See*—
Brettschneider, Johannes; Dobler, Klaus; Haag, Gottlob; Linder, Ernst; and Polach, Wilhelm, 4,478,613, Cl. 55-127.000.
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Haber, Edgar; and Burton, James, to General Hospital Corporation, The. Renin inhibitors. 4,478,827, Cl. 424-177.000.
Hada, Kazunari: *See*—
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Haendle, Joerg; and Maass, Wolfgang, to Siemens Aktiengesellschaft. Method for the production of X-ray images and X-ray television apparatus for carrying out said method. 4,479,231, Cl. 378-99.000.
Hafner, Karl E.; and Kohler, Wolfgang, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injection pump for internal combustion engines. 4,478,196, Cl. 123-504.000.
Hahn, Granville J., to Coaden Technology, Inc. Methods for improving the gas barrier properties of polymeric containers. 4,478,874, Cl. 427-40.000.
Haines, Eldon L.; and Bartera, Ralph E. Self-pumping solar heating system with geyser pumping action. 4,478,211, Cl. 126-433.000.
Hake, Lewis W.; Huff, Charles F.; and Miller, J. Wayne, to Petroleum Concepts, Inc. Drill bit stud and method of manufacture. 4,478,298, Cl. 175-329.000.
Halcon SD Group, Inc., The: *See*—
Khoobiar, Sargis, 4,479,013, Cl. 568-479.000.
Khoobiar, Sargis, 4,479,014, Cl. 568-479.000.
Haley, Neil F.: *See*—
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Haley, William J.: *See*—
Carlson, David K.; Burnia, William G.; and Haley, William J., 4,478,322, Cl. 192-0.055.
Hall, Alethea R. M. Method of joining sheets of a non-magnetic material together. 4,478,659, Cl. 156-73.100.
Halliburton Company: *See*—
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Sumner, Cyril R., 4,478,294, Cl. 175-4.560.
Halmann, Martin M.; Ulman, Mira; and Aurian-Blajeni, Benedict, to Yeda Research & Development Company, Ltd. Photosynthetic solar energy collector and process for its use. 4,478,699, Cl. 204-158.00R.
Halpern, Yuval; Mott, Donna M.; and Niswander, Ron H., to Borg-Warner Chemicals, Inc. Process for preparing amine salts of phosphoric acids. 4,478,998, Cl. 544-195.000.
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Hammond, Harry W.: *See*—
Rosenthal, Hyman; and Hammond, Harry W., 4,478,270, Cl. 164-254.000.
Hanas, Bertil, to ASEA Aktiebolag. Stirring metal in a continuous casting mold. 4,478,273, Cl. 164-468.000.
Haneda, Satoshi; and Itaya, Masahiko, to Konishiroku Photo Industry Co., Ltd. Corona image transfer method. 4,478,870, Cl. 427-14.100.
Hanlon, Raymond J. Breathing device. 4,478,215, Cl. 128-201.130.
Hanna, Marie R.: *See*—
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., 4,478,743, Cl. 252-522.00R.
Hanna Mining Company, The: *See*—
Zambrano, Adolfo R., 4,478,803, Cl. 423-244.000.
Hannah, James T. Electronic control device for decisions and scoring. 4,479,181, Cl. 364-411.000.
Hanner, John C. Apparatus for varying the speed of DC motors. 4,479,079, Cl. 318-345.00G.
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, to Zimmermann & Jansen GmbH. Apparatus for the exact position feedback of a double-acting power piston in a hydraulic power cylinder. 4,478,129, Cl. 91-1.000.
Hanover, Barry K.: *See*—
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., 4,477,971, Cl. 29-877.000.
Hanselmann, Daniel: *See*—
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Hansen, James G.: *See*—
Herr, Francis V.; Walklet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., 4,478,339, Cl. 211-126.000.

Hanson, David G.: *See*—
Granberg, Mauritz L.; and Hanson, David G., 4,479,206, Cl. 367-104.000.

Hanyu, Susumu; Kasuga, Noboru; Nomota, Reishi; and Ebata, Yoshikazu, to Janome Sewing Machine Co., Ltd. Switching device of a double-function sewing machine. 4,478,161, Cl. 112-155.000.

Hara, Hiroshi: *See*—
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; and Sato, Kozo, 4,478,927, Cl. 430-203.000.

Hara, Yoshimichi: *See*—
Naganoma, Masanori; Kato, Yoshiharu; Saito, Atsunori; Hara, Yoshimichi; and Matsushima, Katsuaki, 4,478,274, Cl. 165-12.000.

Harada, Shigeo: *See*—
Shiozawa, Etuo; Ohnishi, Masahiro; and Harada, Shigeo, 4,479,133, Cl. 346-108.000.

Harding, Kevin G.: *See*—
Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., 4,478,481, Cl. 350-3.830.

Hardinge Brothers, Inc.: *See*—
Brown, Ivan R.; and Sheehan, Terrence M., 4,478,117, Cl. 82-32.000.

Harigai, Akinori; Aoki, Shinichi; and Nakayama, Takehisa, to Kabushiki Kaisha BANDAI. Transformable toy vehicle. 4,477,999, Cl. 446-470.000.

Harmeson Manufacturing Co., Inc.: *See*—
Shaffer, Dale A.; Kay, John W.; and Basquin, Maurice H., 4,478,415, Cl. 273-1.50R.

Harpen, Michael D.: *See*—
Lee, Wai-Nang P.; Harpen, Michael D.; and Siegel, Jeffry A., 4,478,945, Cl. 436-500.000.

Harrington, Edward R.: *See*—
Uffner, William E.; White, Robert N.; and Harrington, Edward R., 4,478,912, Cl. 428-349.000.

Harris, David J., to Raytheon Company. Differential amplifier. 4,479,094, Cl. 330-261.000.

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Fusek, Richard L.; Harris, James S.; and Harding, Kevin G., 4,478,481, Cl. 350-3.830.

Harris, Samuel C., to General Electric Company. Step motor drive. 4,479,081, Cl. 318-696.000.

Harrop, Peter, to U.S. Philips Corporation. Coupling and mixing circuit comprising a dual source transistor. 4,479,260, Cl. 455-333.000.

Harshbarger, Harry F.: *See*—
Kurz, John L.; and Harshbarger, Harry F., 4,478,444, Cl. 292-333.000.

Hart, Kevin G. Coupling system for a multiple sectioned boat. 4,478,167, Cl. 114-352.000.

Harter, Donald P., to APX Group, Inc. Universal heat shield. 4,478,310, Cl. 181-241.000.

Hartman Material Handling Systems, Inc.: *See*—
Hartman Peter W.; and Brown, Patsy R., 4,479,207, Cl. 367-107.000.

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Hartwig, Jurgen: *See*—
Kemmel, Patrice J.; and Hartwig, Jurgen, 4,479,077, Cl. 318-245.000.

Harumiya, Noriho: *See*—
Kurihara, Masaru; Harumiya, Noriho; and Uemura, Tadahiro, 4,478,717, Cl. 210-500.200.

Hasegawa, Kenji: *See*—
Mayumi, Yoshishige; Satoh, Kenzoh; Hasegawa, Kenji; and Takahashi, Mitsuyoshi, 4,478,899, Cl. 428-72.000.

Hasegawa, Seitaro: *See*—
Hasegawa, Tsuneo; Nakahara, Kiyoharu; and Hasegawa, Seitaro, 4,478,716, Cl. 210-289.000.

Hasegawa, Tsuneo; Nakahara, Kiyoharu; and Hasegawa, Seitaro, to Seisu Kogyo Co., Ltd. Mixed-bed device for producing pure water. 4,478,716, Cl. 210-289.000.

Hashimoto, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Hose connector. 4,478,436, Cl. 285-137.00R.

Hashimoto, Yoshihiko: *See*—
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,478,982, Cl. 525-316.000.

Haslam, John L.; Higuchi, Takeru; and Mlodozeniec, Arthur R., to Merck & Co., Inc. Drug delivery system utilizing thermosetting gels. 4,478,822, Cl. 424-78.000.

Hasler, Theodore J.: *See*—
Herr, Francis V.; Walklet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., 4,478,339, Cl. 211-126.000.

Hass, Robert H., to Union Oil Company of California. Method for preventing sulfur emissions from vessels containing molten sulfur. 4,478,811, Cl. 423-574.00R.

Hasse, Jaroslav; and Palmberg, Roger, to Ciba-Geigy Corporation. Cationic adsorption agent. 4,478,724, Cl. 210-679.000.

Hassler, Dieter; and Trautenberg, Elmar, to Siemens Aktiengesellschaft. Plane reconstruction ultrasound tomography device. 4,478,083, Cl. 73-620.000.

Hassler, Dieter; and Trautenberg, Elmar, to Siemens Aktiengesellschaft. Ultrasound tomography device. 4,478,084, Cl. 73-620.000.

Hastings, Donald R., to Nordson Corporation. Air atomizing nozzle assembly. 4,478,370, Cl. 239-707.000.

Hastings, Jerome K.: *See*—
Offutt, Warren B.; and Hastings, Jerome K., 4,479,162, Cl. 361-210.000.

Hasumi, Ryoichi: *See*—
Nishikawa, Yasuhisa; Tanaka, Yoshio; Hasumi, Ryoichi; and Koizumi, Takashi, 4,478,098, Cl. 74-10.330.

Hatae, Seiryo: *See*—
Akisue, Osamu; Hatae, Seiryo; Toki, Hiroaki; Nakazawa, Kichi; and Wakako, Atsuhiro, 4,478,649, Cl. 148-12.00C.

Hattori, Kyo: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,479,068, Cl. 310-194.000.

Hattori, Yoshiya: *See*—
Kohno, Kiyoshi; Nishikawa, Satoshi; Hattori, Yoshiya; and Kitao, Kohji, 4,478,990, Cl. 526-279.000.

Hattori, Yoshiyuki: *See*—
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Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,478,550, Cl. 415-53.00T.

Hauni-Werke Korber & Co. KG.: *See*—
Rudszinat, Willy, 4,478,231, Cl. 131-84.00C.

Haverland, Patricia L.: *See*—
Haverland, Walter K., Jr.; and Haverland, Patricia L., 4,478,349, Cl. 220-410.000.

Haverland, Walter K., Jr.; and Haverland, Patricia L., to Mirro Corporation. Insulated dish and lid for microwave cooking. 4,478,349, Cl. 220-410.000.

Hawk Eye, Inc.: *See*—
Von Holten, Hubert B., 4,478,369, Cl. 239-664.000.

Hawrylo, Frank Z., to United States of America, Air Force. Diffusion barrier for long wavelength laser diodes. 4,479,222, Cl. 372-45.000.

Hayakawa, Hideyuki; Matsui, Kazuma; Hattori, Yoshiyuki; and Kinbara, Hiroji, to Nippondenso Co., Ltd. Electric control apparatus for belt tensioners. 4,478,595, Cl. 474-109.000.

Hayakawa, Takaki: *See*—
Kikuchi, Masakazu; Hayakawa, Takaki; and Kida, Makoto, 4,478,937, Cl. 435-172.300.

Hayashi, Munehiro: *See*—
Saito, Hidefumi; Hayashi, Munehiro; Mitani, Hisashi; Isaka, Hiromu; and Andoh, Masanao, 4,478,046, Cl. 62-6.000.

Hayashi, Nobuyuki: *See*—
Yabuoshi, Susumu; Uzura, Shogo; and Hayashi, Nobuyuki, 4,477,967, Cl. 29-596.000.

Hayden, Ronald D., to Euclid, Inc. Vehicle brake system. 4,478,318, Cl. 188-72.400.

Hayes, Gerald G., to Kidde Recreation Products, Inc. Compound bow cable and bowstring attachment means. 4,478,203, Cl. 124-24.00R.

Hayner, John M.: *See*—
Sayler, William M.; and Hayner, John M., 4,478,150, Cl. 102-430.000.

Hazama, Junji: *See*—
Azuma, Toru; Hazama, Junji; Kawahara, Atsushi; Hada, Kazunari; and Fujii, Norio, 4,479,145, Cl. 358-106.000.

Hazeltine Corporation: *See*—
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Healey, Richard: *See*—
Kruger, Albert; and Healey, Richard, 4,478,794, Cl. 423-89.000.

Heberlein Hispano SA: *See*—
Vignon, Louis; and Schopper, Alf, 4,477,945, Cl. 19-236.000.

Hebert, Donald G., to Hebert, Donald G.; and Falk, Helmut. Wire matrix print head assembly. 4,478,528, Cl. 400-124.000.

Heiland, Wolfgang K.; and Magidman, Paul, to United States of America, Agriculture. Shielded sniffing device. 4,478,096, Cl. 73-864.730.

Heiland, Wolfgang K., to United States of America, Agriculture. Automatic hide processing apparatus. 4,478,328, Cl. 198-479.000.

Heimes, Daniel A. Forage accumulator box. 4,478,548, Cl. 414-502.000.

Heiser, Joachim; Leutner, Volkmar; Schuttenberg, Eckard; and Weigle, Dieter, to Robert Bosch GmbH. Electrohydraulic control arrangement for hydrostatic machine. 4,478,136, Cl. 91-506.000.

Heiss, Volker, to Josef Heiss Medizintechnik GmbH. Instrument for use in surgery. 4,478,221, Cl. 128-334.00R.

Heiz, Ulrich, to Inventio AG. Transfer apparatus for pallets and similar piece goods. 4,478,329, Cl. 198-574.000.

Hekal, Ihab M.; and Erlandson, Paul M., to Continental Group, Inc., The. Process for improving the organoleptic properties of canned green vegetables. 4,478,860, Cl. 426-267.000.

Helffrich, David J., to Bell and Howell Company. Sensor alignment circuit and method of operation. 4,479,050, Cl. 235-474.000.

Helgesson, Gote; Mansson, Bjorn; and Wallin, Nils-Hakan, to AB Casco. Cellulosic board. 4,478,966, Cl. 524-13.000.

Hench, Larry L.: *See*—
Ducheyne, Paul L. R.; and Hench, Larry L., 4,478,904, Cl. 428-288.000.

Hendrischk, Wolfgang; and Nolte, Gerhard, to Mannesmann Aktiengesellschaft. Printer. 4,478,143, Cl. 101-93.050.

Henmi, Shoichi: *See*—
Shimizu, Yutaka; Imura, Junichi; and Henmi, Shoichi, 4,479,106, Cl. 338-160.000.

Henneberg, Hans H.: *See*—
Romano, Domenic R.; Henneberg, Hans H.; Pratt, James W.; and Coppelman, Maurice A., 4,479,198, Cl. 364-900.000.
Henning, Manfred: *See*—
Misch, Wolfgang; Freytag, Adolf; and Henning, Manfred, 4,478,183, Cl. 123-339.000.
Hennings, George N.; Brauer, Larry F.; and DeHarrold, Raymond H., to United States of America, Navy. Bomb saddle interface module. 4,478,127, Cl. 89-1.50D.
Hennings, George N.; Brauer, Larry F.; and Nickles, Richmond H., to United States of America, Navy. Tri-rotor safe and arm device. 4,478,147, Cl. 102-255.000.
Henrich, Robert S.; and Walworth, John A., to Bendix Corporation, The. Switching type driver circuit for fuel injector. 4,479,161, Cl. 361-154.000.
Hercelin, Bernard; Mary, Irene; and Nung, Vien N., to Roussel Rclaf. Novel oral preparations. 4,478,819, Cl. 424-37.000.
Hercules Incorporated: *See*—
Bankert, Ralph A.; and Dumas, David H., 4,478,682, Cl. 162-158.000.
Gibson, James D., 4,478,656, Cl. 149-19.400.
Hereda, Maryellen; and Fischer, Stephen A., to Diamond Shamrock Chemicals Company. Aluminum trihydroxide deliquoring with anionic polymers. 4,478,795, Cl. 423-127.000.
Heredia-De-La-Paz, Jorge Alfredo: *See*—
Cardenas-Franco, Luis; Veazey-Menendez, Enrique; and Heredia-De-La-Paz, Jorge Alfredo, 4,478,241, Cl. 137-340.000.
Herlihy, Walter C., to Repligen Corporation. In vitro enzymatic process for producing glucuronides. 4,478,936, Cl. 435-78.000.
Herr, Diane E.; Metz, Reinhard; and Russell, Larry A., to AT&T Bell Laboratories. Data conference system. 4,479,195, Cl. 364-900.000.
Herr, Francis V.; Walklet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., to McDonald Products Corporation. Office accessory system for use on both horizontal and vertical surfaces. 4,478,339, Cl. 211-126.000.
Herr, Manfred: *See*—
Fischer, Karl; Grenacher, Armin V.; Herr, Manfred; and Strohmeyer, Max, 4,479,012, Cl. 568-454.000.
Hertell, Siegfried: *See*—
Schippers, Heinz; and Hertell, Siegfried, 4,478,562, Cl. 418-88.000.
Hertzler, Merle E., to RCA Corporation. Changeable liquid reservoir and stirrer apparatus. 4,478,172, Cl. 118-612.000.
Herzberg, Walter J.: *See*—
Kelley, Edwin L.; Herzberg, Walter J.; and Sinka, Joseph V., 4,478,602, Cl. 44-51.000.
Hess, Peter; Muhling, Gunter; and Schust, Gerhard, to Metallwerk Max Brose GmbH & Co. Driving gear. 4,478,099, Cl. 74-11.000.
Hess, Thomas C.; and Wiegers, Karl E., to Eastman Kodak Company. Application of activated arylhydrazides to silver halide photography. 4,478,928, Cl. 430-217.000.
Hess, Walter; Nicolai, Franz; Treiss, Erich; and Gotting, Otto, to Mannesmann Aktiengesellschaft. Controlling the zone of longitudinally seam-welding split tubes. 4,479,043, Cl. 219-8.500.
Hesse, Karl-Heinz: *See*—
Liermann, Peter; Hesse, Karl-Heinz; Meyer, Dietmar; and Gudat, Wolfgang, 4,478,131, Cl. 91-356.000.
Hesston Corporation: *See*—
Druais, Robert E. J.; and Barbeau, Damien M. M., 4,478,030, Cl. 56-60.000.
Hettche, Albert: *See*—
Klahr, Erhard; Rebafka, Walter; Nissen, Axel; Trieselt, Wolfgang; and Hettche, Albert, 4,479,016, Cl. 568-606.000.
Hetterich, Hermann: *See*—
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,478,066, Cl. 72-358.000.
Hetzler, John C.: *See*—
Applebaum, Albert; Will, Albert S.; Humphrey, Samuel A.; McLean, Frank C.; Wolf, Sylvan; Peterson, Carl R.; Gauzza, Harry J.; and Hetzler, John C., 4,478,148, Cl. 102-390.000.
Heuer, Daniel A.: *See*—
Caspari, Frederick W.; Smith, Bruce E.; and Heuer, Daniel A., 4,479,248, Cl. 455-183.000.
Hewlett-Packard Company: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,479,197, Cl. 364-900.000.
Miller, David G., 4,479,069, Cl. 310-334.000.
Heyse, Klaus; and Andrae, Klaus, to Hoechst Aktiengeselischaft. Process and apparatus for forming a tube from a flat web. 4,478,670, Cl. 156-380.100.
Hicks, Irwin A.; and Schneider, George W., Jr., to Singer Company, The. Direct gearless drive mechanism for an internal gate rotary vane fluid meter. 4,478,078, Cl. 73-253.000.
Hicks, Irwin A.; and Kee, David F., to Singer Company, The. Internal gate rotary vane fluid meter with contoured inlet and outlet passages. 4,478,079, Cl. 73-253.000.
Higuchi, Mitsuo; and Arakawa, Hideki, to Fujitsu Limited. MIS Decoder circuit. 4,479,126, Cl. 340-825.860.
Higuchi, Takeru: *See*—
Haslam, John L.; Higuchi, Takeru; and Mlodozeniec, Arthur R., 4,478,822, Cl. 424-78.000.
Hill, Cliff O.: *See*—
Jones, Cynthia G.; and Hill, Cliff O., 4,478,929, Cl. 430-217.000.
Hillshafer, Douglas K., to Dow Chemical Company, The. Method for determining component ratios employed to prepare polymers. 4,478,941, Cl. 436-56.000.
Hilti Aktiengesellschaft: *See*—
Weilenmann, Walter; Frick, Nikolaus; and Hirt, Peter, 4,478,293, Cl. 173-162.00R.
Hira, Yasuo: *See*—
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Hirai, Yutaka: *See*—
Yoshioka, Seishiro; Hirai, Yutaka; Fukuda, Tadaji; Fukaya, Masaki; and Nakagiri, Takashi, 4,479,149, Cl. 358-294.000.
Hirano, Hiroyuki: *See*—
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Hirata, Sadao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, 4,478,889, Cl. 427-230.000.
Hirose, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic bank note transaction apparatus. 4,479,049, Cl. 235-379.000.
Hirsch, Steven B., to Secure Keyboards Limited. Secure input system. 4,479,112, Cl. 340-365.0VL.
Hirschbein, Bernard L.: *See*—
Whitesides, George M.; Hirschbein, Bernard L.; and Mazenod, Francois P., 4,478,762, Cl. 260-983.000.
Hirt, Peter: *See*—
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Hisano, Katsukuni: *See*—
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Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, 4,478,917, Cl. 429-33.000.
Imahashi, Hiromichi; Turuoka, Shigeo; Kuniya, Keiichi; Iizuka, Tomio; and Kawahara, Akira, 4,478,363, Cl. 228-131.000.
Kawamura, Shinichiro; and Irimajiri, Takahiko, 4,478,309, Cl. 181-167.000.
Miyoshi, Tadahiko; Yoshikawa, Masanori; and Taguchi, Mitsuo, 4,478,704, Cl. 204-412.000.
Oyama, Yoshishige; Kuroiwa, Hiroshi; and Nishimura, Yutaka, 4,478,075, Cl. 73-118.200.
Sato, Ichiya; Yoneyama, Takao; Koga, Tsuguaki; Ikeuchi, Kazuo; and Hisano, Katsukuni, 4,478,082, Cl. 73-593.000.
Shimada, Tamotsu; Kumada, Akio; Tokinaga, Daizo; Shinbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,478,217, Cl. 128-303.100.
Tamura, Hifumi; Ishitani, Tohru; and Shimase, Akira, 4,479,060, Cl. 250-398.000.
Tsuzuku, Susumu; Hira, Yasuo; Gotoh, Masao; Yokono, Hitoshi; and Hosoe, Yoshihisa, 4,478,902, Cl. 428-174.000.
Hjelsand, Timothy A.; and Moore, Paul A., to Halliburton Company. Oil seal and unitized seal carrier for reciprocating shaft. 4,478,423, Cl. 277-59.000.
Hobczuk, Michael P.: *See*—
Adair, Peter J.; Hobczuk, Michael P.; Kingsbury, Paul I.; and Nelson, John W., 4,478,641, Cl. 106-110.000.
Hobrock, Lowell M.: *See*—
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Hock, Karl-Ludwig: *See*—
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Adrian, Klaus; and Rosch, Gunter, 4,478,737, Cl. 252-186.250.
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Konig, Wolfgang; Ge ger, Rolf; Obermeier, Rainer; and Mullner, Hubert, 4,478,828, Cl. 424-177.000.
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Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,478,948, Cl. 502-25.000.
Sturm, Karl; Muschaweck, Roman; and Hropot, Max, 4,478,843, Cl. 424-269.000.
Hoerenz, Peter G., to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Operation microscope with fixation device. 4,478,499, Cl. 351-211.000.
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Hogan, Tanai N.; and Woods, James A., to Martin Marietta Corporation. Protective entranceway. 4,478,001, Cl. 49-37.000.
Hohman, Charles M.; Propster, Mark A.; Dunn, Charles; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Recuperation of heat absorbent media to preheat combustion gases and glass batch. 4,478,627, Cl. 65-27.000.
Hokama, Takeo, to Velsicol Chemical Corporation. Heterocyclic amides of phenoxyphenoxyalkanoic acids. 4,478,634, Cl. 71-88.000.
Hokkai Can Co., Ltd.: *See*—
Homma, Yoshihiro, 4,478,351, Cl. 220-462.000.
Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itho, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; and Yamagishi, Kagari, 4,478,838, Cl. 424-250.000.
Holand, John F. Thermal break exterior insulated wall framing system. 4,478,018, Cl. 52-220.000.

Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., to Dayco Corporation. Pedestal liner for railway vehicle and method of making same. 4,478,154, Cl. 105-225.000.

Holland, Ann C., to Dow Chemical Company, The. Well treating process and composition. 4,478,640, Cl. 106-76.000.

Holland, James R.; and Del Vecchio, Robert M., to United States of America, Energy. Multishell inertial confinement fusion target. 4,477,958, Cl. 29-423.000.

Holley Engineering Company, Inc.: *See*—
Holley, John D., 4,478,152, Cl. 104-279.000.

Holley, John D., to Holley Engineering Company, Inc. Railroad scrap pick up machine. 4,478,152, Cl. 104-279.000.

Holman, David: *See*—
Fisher, John; and Holman, David, 4,478,175, Cl. 119-16.000.

Holmes, Ralph. Calculator and apparatus for macrophotography. 4,479,169, Cl. 362-5.000.

Holmlund, Dan; and Ohlson, Johnny. Chamber for containing explosions, deflagrations or detonation and method of manufacture. 4,478,126, Cl. 86-1.00B.

Holsworth, Richard M.; and Provder, Theodore, to SCM Corporation. Method for determining particle size and/or distribution. 4,478,073, Cl. 73-61.400.

Holub, Fred F.: *See*—
Abolins, Viswaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,478,979, Cl. 525-68.000.

Holzhauer, Norman H., to AT&T Bell Laboratories. Fan speed and/or fan failure detector. 4,479,115, Cl. 340-611.000.

Homma, Yoshihiro, to Hokkai Can Co., Ltd. Compound packing container. 4,478,351, Cl. 220-462.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kawahara, Eiichiro; and Ikeda, Koichi, 4,478,134, Cl. 91-488.000.
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Honda Motor Co., Ltd.: *See*—
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Honegger, Rolf, to Ruti Machinery Works, Ltd. Reed for jet weaving machines. 4,478,259, Cl. 139-435.000.

Honeycutt, Fred L., Jr.; and Lindstrom, Erik A., to United Technologies Corporation. Turbine exhaust case design. 4,478,551, Cl. 415-142.000.

Honeywell Inc.: *See*—
Bohrer, Philip J., 4,478,076, Cl. 73-204.000.
Bohrer, Philip J.; and Johnson, Robert G., 4,478,077, Cl. 73-204.000.
Gille, Robert A.; Planer, Norman G.; and Zansky, Zoltan, 4,479,175, Cl. 363-41.000.

Honeywell Information Systems Inc.: *See*—
Romano, Domenic R.; Henneberg, Hans H.; Pratt, James W.; and Coppelman, Maurice A., 4,479,198, Cl. 364-900.000.

Honkaniemi, Matti E.; Juntunen, Veikko A.; Keinanen, Veli J.; and Mansikka, Urpo J., to Outokumpu Oy. Method for cleaning cyanide-bearing gas scrubbing waters produced in metallurgical industry. 4,478,802, Cl. 423-236.000.

Hoo, Stanley S.: *See*—
Frater, Norman K.; Hoo, Stanley S.; and McConnell, William H., 4,479,090, Cl. 324-454.000.

Hopeman Brothers, Inc.: *See*—
Salminen, Arthur H., 4,477,934, Cl. 4-663.000.

Hopkins, Daniel N.; and Snavely, Earl S., to Mobil Oil Corporation. Steam drive oil recovery method utilizing a downhole steam generator. 4,478,280, Cl. 166-260.000.

Hopkins, Jon D.: *See*—
Fenwick, Danny L.; and Hopkins, Jon D., 4,479,041, Cl. 200-81.00R.

Hopkins, William J.; Sweeney, Paula C.; and Bailey, David G., to United States of America, Agriculture. Process and compositions for preserving fresh hides and skins. 4,478,728, Cl. 252-8.570.

Hoppe, Hans; Bercx, Helmut; and Siegel, Wolfgang, to Waeschle Maschinenfabrik GmbH. Process and gravity feed mixer for mixing bulk materials in a container. 4,478,517, Cl. 366-101.000.

Hoppie, Lyle O.; McNinch, Joseph H., Jr.; and Nowell, Gregory C., to Eaton Corporation. Method for making an elastomeric member with end pieces. 4,478,777, Cl. 264-102.000.

Horgan, John J., to United Technologies Corporation. Utilization of coal in a combined cycle powerplant. 4,478,039, Cl. 60-39.020.

Hori, Hirokazu: *See*—
Endo, Gen; Hori, Hirokazu; Kawada, Yoshihiro; and Sakai, Junzo, 4,478,775, Cl. 264-40.300.

Hori, Osamu: *See*—
Ueda, Masahiro; Noba, Masahiko; Hori, Osamu; Murata, Kimitoshi; and Nakao, Hatsuo, 4,479,063, Cl. 290-30.00R.

Horiba, Tatsuo: *See*—
Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, 4,478,917, Cl. 429-33.000.

Horikita, Hiroyuki; and Kataoka, Tetsuo, to NGK Insulators, Ltd. Air diffuser for waste water treatment. 4,478,766, Cl. 261-124.000.

Horiuchi, Hideyuki: *See*—
Shimada, Tamotsu; Kumada, Akio; Tokinaga, Daizo; Shinbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,478,217, Cl. 128-303.100.

Horling, Peter: *See*—
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,478,066, Cl. 72-358.000.

Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,478,732, Cl. 252-49.600.

Horvath, Joseph L., to International Business Machines Corporation. Thermal conduction element for conducting heat from semiconductor devices to a cold plate. 4,479,140, Cl. 357-81.000.

Hosaka, Tomiharu: *See*—
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,478,753, Cl. 260-396.00N.

Hoshii, Toshifumi, to Casio Computer Co., Ltd. Electronic equipment with tone generating function. 4,478,123, Cl. 84-1.030.

Hosoe, Yoshihisa: *See*—
Tsuzuku, Susumu; Hira, Yasuo; Gotoh, Masao; Yokono, Hitoshi; and Hosoe, Yoshihisa, 4,478,902, Cl. 428-174.000.

Hosokawa, Takehiko: *See*—
Yamato, Akihiro; Koike, Akihiko; Hosokawa, Takehiko; and Maruyama, Nobutoshi, 4,478,194, Cl. 123-491.000.

Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, to Matsushita Electric Industrial Co., Ltd. Process for the production of 11,11,12,12-tetracyano-9,10-anthraquinodimehane or its derivatives. 4,478,753, Cl. 260-396.00N.

Houman, Leif, to Medetec Industries, Inc. Soft dessert dispensing arrangement. 4,478,355, Cl. 222-54.000.

Houminer, Yoram; and Grubbs, Harvey J., to Philip Morris, Incorporated. Heterocyclic-hydroxy-substituted carboxylate esters. 4,479,003, Cl. 546-341.000.

Houseknecht, Gary L.: *See*—
Kackenmeister, Carl F.; and Houseknecht, Gary L., 4,478,571, Cl. 431-359.000.

Houte, Bernard: *See*—
Pittion, Philippe; Andre, Guy; Souillard, Gerald; J'espere, Jean-Louis; and Houte, Bernard, 4,478,381, Cl. 248-71.000.

HRI, Inc.: *See*—
Ganguli, Partha S., 4,478,705, Cl. 208-59.000.

Hropot, Max: *See*—
Sturm, Karl; Muschaweck, Roman; and Hropot, Max, 4,478,843, Cl. 424-269.000.

Hsu, Chao-Yang; and Lyons, James E., to Sun Tech, Inc. Process for oxidizing phenol to p-benzoquinone. 4,478,752, Cl. 260-396.00R.

Hu, Paul Y.: *See*—
Froehlich, Frederick B.; and Hu, Paul Y., 4,479,158, Cl. 360-130.100.

Huang, Francis Y.: *See*—
Raba, Carl F., Jr.; Smith, Robert L.; and Huang, Francis Y., 4,478,736, Cl. 252-180.000.

Huang, John J.: *See*—
Mezei, Louis M.; Chen, Jung S.; Huang, John J.; and Lovins, Robert E., 4,478,744, Cl. 260-112.50R.

Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., to General Electric Company. Method for imparting strength and ductility to intermetallic phases. 4,478,791, Cl. 420-590.000.

Huang, Sun Y.; and Giglia, Robert D., to American Cyanamid Company. Sulfonic acid copolymer electrolyte. 4,478,991, Cl. 526-287.000.

Hubele, Adolf; and Riebli, Peter, to Janssen Pharmaceutica N.V. 1-[2-(4-Diphenyl)-1,3-dioxolan-2-yl-methyl]-1-H-triazoles. 4,479,004, Cl. 548-101.000.

Hubis, Daniel E., to W. L. Gore & Associates, Inc. Method for manufacturing highly porous, high strength PTFE articles. 4,478,665, Cl. 156-229.000.

Hudelmaier, Gerhard, to Hudelmaier, Ingrid. Vibrating concrete mixer. 4,478,514, Cl. 366-2.000.

Hudelmaier, Ingrid: *See*—
Hudelmaier, Gerhard, 4,478,514, Cl. 366-2.000.

Huebscher, Laszlo: *See*—
Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, 4,478,220, Cl. 128-326.000.

Huff, Charles F.: *See*—
Hake, Lewis W.; Huff, Charles F.; and Miller, J. Wayne, 4,478,298, Cl. 175-329.000.

Huff, Terrence, to Exxon Research & Engineering Co. Titanium trichloride catalyst component and the process for the production thereof. 4,478,951, Cl. 502-108.000.

Hughes Aircraft Company: *See*—
Domingo, George, 4,479,201, Cl. 365-183.000.
Rogers, James E.; Warniak, James S.; Hobrock, Lowell M.; Bafico, Michael A.; and Scheele, Stephen R., 4,479,131, Cl. 343-872.000.
Wreede, John E.; and Arns, James A., 4,478,490, Cl. 350-162.110.

Hughes Tool Company: *See*—
Selden, Gary F., 4,478,611, Cl. 51-307.000.

Humphrey, Samuel A.: *See*—
Applebaum, Albert; Will, Albert S.; Humphrey, Samuel A.; McLean, Frank C.; Wolf, Sylvan; Peterson, Carl R.; Gauzza, Harry J.; and Hetzler, John C., 4,478,148, Cl. 102-390.000.

Hunsucker, Jerry H., to Angus Chemical Company. Method of treating textiles. 4,478,597, Cl. 8-181.000.

Hunt, Mack W.; and West, Charles T., to Standard Oil Company (Indiana). Molybdenum sulfonates for friction reducing additives. 4,478,729, Cl. 252-33.200.

Hunter, Donald F.: *See*—
Lobo, Edward M.; and Hunter, Donald F., 4,477,953, Cl. 29-25.420.

Hunter, James R., to Warner & Swasey Company, The. Punch head for a punch press. 4,478,122, Cl. 83-549.000.

Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. Process of pressureless sintering to produce dense, high thermal conductivity aluminum nitride ceramic body. 4,478,785, Cl. 264-65.000.

Hussmann Corporation: *See—*
DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., 4,478,050, Cl. 62-193.000.

Huther, Werner; and Rossmann, Axel, to MTU Motoren-und Turbinen-Union Munchen GmbH. Method and apparatus for manufacturing molded articles of alloyed material. 4,478,790, Cl. 419-54.000.

Huzyak, Paul E., to E. W. Bliss Company, Inc. Strip shape measuring roll. 4,478,062, Cl. 72-17.000.

Hyde, Jack, to Raymond Kaiser Engineers Inc. Blast furnace stove outlet. 4,478,575, Cl. 432-217.000.

Hyde, Richard E.; and Carmichael, Lee T., to California Strolee, Inc. Foldable infant stroller. 4,478,427, Cl. 280-642.000.

Hydra-Rig, Incorporated: *See—*
Elliston, Thomas L., 4,478,561, Cl. 417-400.000.

Hydril Company: *See—*
Hynes, Joseph H.; and Elkins, Hubert L., 4,478,287, Cl. 166-341.000.
Puntar, Joseph; and Parham, B. J., 4,478,279, Cl. 166-121.000.

Hynes, Joseph H.; and Elkins, Hubert L., to Hydril Company. Well control method and apparatus. 4,478,287, Cl. 166-341.000.

Hyzak, Daniel L., to Stauffer Chemical Company. Herbicidal compositions of extended soil life. 4,478,636, Cl. 71-100.000.

I. S. C. Smelting Limited: *See—*
Kruger, Albert; and Healey, Richard, 4,478,794, Cl. 423-89.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Energy efficient glass door merchandiser. 4,478,047, Cl. 62-82.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Electronic temperature control system. 4,478,051, Cl. 62-212.000.

Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippan Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Stepping motor device for changing the position of a rotating body. 4,479,068, Cl. 310-194.000.

Idzorek, George C.: *See—*
Morris, Christopher L.; Idzorek, George C.; and Atencio, Leroy G., 4,479,059, Cl. 250-385.000.

Igarashi, Akira: *See—*
Ikeda, Kensuke; and Igarashi, Akira, 4,479,138, Cl. 346-207.000.

Ihara, Tatuhiko: *See—*
Kuwahara, Tosihide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, 4,478,643, Cl. 106-288.00Q.

Ihlein, Walter, to Siemens Aktiengesellschaft. Impregnated insulating tape for fabricating an insulating sleeve for electric conductors. 4,478,906, Cl. 428-324.000.

Ii, Akira; Morikawa, Toshio; and Suwahara, Hirosi, to Toyota Jidoshi Kabushiki Kaisha. Air valve type carburetor. 4,478,764, Cl. 261-50.00A.

Iizuka, Tomio: *See—*
Imahashi, Hiromichi; Turuoka, Shigeo; Kuniya, Keiichi; Iizuka, Tomio; and Kawahara, Akira, 4,478,363, Cl. 228-131.000.

Ikeda, Giichi: *See—*
Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, 4,478,995, Cl. 536-46.000.

Ikeda, Kensuke; and Igarashi, Akira, to Fuji Photo Film Co., Ltd. Heat-sensitive recording materials. 4,479,138, Cl. 346-207.000.

Ikeda, Koichi: *See—*
Kawahara, Eiichiro; and Ikeda, Koichi, 4,478,134, Cl. 91-488.000.

Ikeda, Shoji: *See—*
Kuwahara, Tosihide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, 4,478,643, Cl. 106-288.00Q.

Ikemoto, Yutaka; and Tsuda, Hiroshi, to Sharp Kabushiki Kaisha. Speech synthesizer timepiece with minimal number of keys for time announcements. 4,478,523, Cl. 368-63.000.

Ikeuchi, Kazuo: *See—*
Sato, Ichiya; Yoneyama, Takao; Koga, Tsuguaki; Ikeuchi, Kazuo; and Hisano, Katsukuni, 4,478,082, Cl. 73-593.000.

Illinois Tool Works Inc.: *See—*
Zeller, Albert M.; and Janes, Edward W., 4,478,669, Cl. 156-379.700.

Ilmer, Andreas; and Andreae, Karl, to BASF Aktiengesellschaft. Methods and arrangements for changing the audio information in an audio/video recording/reproduction system. 4,479,150, Cl. 358-310.000.

Imahashi, Hiromichi; Turuoka, Shigeo; Kuniya, Keiichi; Iizuka, Tomio; and Kawahara, Akira, to Hitachi, Ltd. Method of production of composite billet for fuel cladding tube. 4,478,363, Cl. 228-131.000.

Imai, Tamotsu, to UOP Inc. Alkylaromatic hydrocarbon dehydrogenation process. 4,479,025, Cl. 585-441.000.

Imperial Chemical Industries PLC: *See—*
Brittain, David R.; and Wood, Robin, 4,478,847, Cl. 424-274.000.

Imperial College of Science & Technology: *See—*
Cohen, Enrico; and Good, Jeremy A., 4,478,711, Cl. 209-39.000.

Imura, Junichi: *See—*
Shimizu, Yutaka; Imura, Junichi; and Henmi, Shoichi, 4,479,106, Cl. 338-160.000.

Ina, Toshikazu: *See—*
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.

Indumat S.A.: *See—*
Lhommeau, Robert E.; and Ducruy Guy R., 4,478,563, Cl. 425-71.000.

Inman, Billy E., to Milliken Research Corporation. Method to replace looper elements. 4,477,957, Cl. 29-402.080.

Innovative Concepts, Inc.: *See—*
Long, Jerry M.; and Womack, James A., 4,478,335, Cl. 206-444.000.

Innse Innocenti Santeustacchio S.p.A.: *See—*
Gancia, Emanuele; and Galletti, Cesare, 4,478,065, Cl. 72-239.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,479,044, Cl. 219-69.00W.
Inoue, Kiyoshi, 4,479,045, Cl. 219-69.00W.

Inoue, Kiyoshi; and Shimizu, Akihiko, to Inoue-Japax Research Incorporated. Electrode assembly for travelling-wire electroerosion machine. 4,479,044, Cl. 219-69.00W.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Traveling-wire electroerosive cutting method and apparatus. 4,479,045, Cl. 219-69.00W.

Inoue, Seijiro: *See—*
Ohta, Shigenori; Inoue, Seijiro; Torigoe, Takaoki; and Kobayashi, Makoto, 4,478,866, Cl. 426-549.000.

Inoue, Tokuta: *See—*
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,478,182, Cl. 123-188.00M.

Inskeep, William B. Dual implement hitch. 4,478,032, Cl. 56-377.000.

Institut Francais du Petrole: *See—*
Arnaudeau, Marcel, 4,478,712, Cl. 210-96.100.
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,478,707, Cl. 208-157.000.

Institut Kataliza Sibirskogo Otdelenia Akademii Nauk SSSR: *See—*
Matros, Jury S.; Boreskov, Georgy K.; Lakhmostov, Viktor S.; Volkov, Viktor J.; and Ivanov, Alexei A., 4,478,808, Cl. 423-522.000.

Interior Security Corp.: *See—*
English, Thomas A., 4,478,002, Cl. 49-57.000.

Interlake, Inc.: *See—*
Rosenthal, Hyman; and Hammond, Harry W., 4,478,270, Cl. 164-254.000.

International Business Machines Corporation: *See—*
Aviles, Henry E.; Gregory, Jane A.; Panissidi, Hugo A.; and Wattenbarger, Henry E., 4,478,089, Cl. 73-862.040.
Bupp, James R.; Markovich, Voya; Napp, Tracy E.; and Sambucetti, Carlos J., 4,478,883, Cl. 427-97.000.
Chen, Lee; Chuang, Tung J.; and Mathad, Gangadhara S., 4,478,677, Cl. 156-635.000.
Dinwiddie, John M., Jr., 4,479,179, Cl. 364-200.000.
Frater, Norman K.; Hoo, Stanley S.; and McConnell, William H., 4,479,090, Cl. 324-454.000.
Froehlich, Frederick B.; and Hu, Paul Y., 4,479,158, Cl. 360-130.100.
Galand, Claude; and Nussbaumer, Henri, 4,479,213, Cl. 370-118.000.
Gendler, Paul L.; and Twieg, Robert J., 4,478,687, Cl. 204-2.000.
Horvath, Joseph L., 4,479,140, Cl. 357-81.000.
Rita, Robert A., 4,478,947, Cl. 501-15.000.
Ryan, Philip M., 4,479,214, Cl. 371-11.000.

International Flavors & Fragrances Inc.: *See—*
Belko, Robert P.; Boden, Richard M.; and Hanna, Marie R., 4,478,743, Cl. 252-522.00R.

International Minerals & Chemical Corp.: *See—*
Williams, Robert D.; Bright, David R.; Young, Vernon V.; and Martin, Jerome L., 4,478,935, Cl. 435-75.000.

Intertherm Inc.: *See—*
Ahn, Hongsik, 4,478,206, Cl. 126-99.00A.

Inventab Audio Kb: *See—*
Mattisson, Sven, 4,479,093, Cl. 330-258.000.

Inventio AG: *See—*
Heiz, Ulrich, 4,478,329, Cl. 198-574.000.

Ireland, Jeffrey: *See—*
Larson, David N.; Ireland, Jeffrey; and Terry, Michael B., 4,479,097, Cl. 331-111.000.

Irimajiri, Takahiko: *See—*
Kawamura, Shinichiro; and Irimajiri, Takahiko, 4,478,309, Cl. 181-167.000.

Irwin, Everett F. Rotating cylinder continuous external combustion engine. 4,478,135, Cl. 91-492.000.

Isaka, Hiromu: *See—*
Saito, Hidefumi; Hayashi, Munehiro; Mitani, Hisashi; Isaka, Hiromu; and Andoh, Masanao, 4,478,046, Cl. 62-6.000.

Ishiguro, Yasuo, to Copal Company Limited; and Konishiroku Photo Industry Co., Ltd., a part interest. Exposure controlling device adapted to cameras using interchangeable lenses. 4,478,500, Cl. 354-443.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Tominaga, Hiroo; Fujimoto, Kaoru; and Shikada, Tsutomu, 4,478,801, Cl. 423-235.000.

Ishise, Kojiro; and Kojima, Keiichi, to Sumitomo Electric Industries, Inc. Heat-shrinkable tube with semiconductive parts for use in joining electrical cables. 4,479,031, Cl. 174-73.00R.

Ishitani, Tohru: *See—*
Tamura, Hifumi; Ishitani, Tohru; and Shimase, Akira, 4,479,060, Cl. 250-398.000.

Ishkhanov, Evgeny S.: *See—*
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Isover Saint-Gobain: *See*—
Battigelli, Jean A.; and Plantard, Dominique, 4,478,624, Cl. 65-4.400.
Issler, Heinz; and Maul, Rudolf, to Ciba-Geigy Corporation. Continuous process for producing 1,2-alkanediols. 4,479,021, Cl. 568-868.000.
Italtel Societa Italiana Telecomunicazioni S.P.A.: *See*—
Roberto, Scorta, 4,478,882, Cl. 427-97.000.
Itaya, Masahiko: *See*—
Haneda, Satoshi; and Itaya, Masahiko, 4,478,870, Cl. 427-14.100.
Itho, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; and Yamagishi, Kagari, to Hokuriku Pharmaceutical Co., Ltd. 1-(3,4,5-Trimethoxycinnamoyl)-4-alkylaminocarbonylethyl piperazines. 4,478,838, Cl. 424-250.000.
Ito, Hiroshi: *See*—
Sakaguchi, Shigeya; Shiroyama, Masaharu; and Ito, Hiroshi, 4,478,871, Cl. 427-34.000.
Ito, Seisiro: *See*—
Kuwahara, Toshihide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, 4,478,643, Cl. 106-288.00Q.
ITT Industries, Inc.: *See*—
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,478,004, Cl. 49-72.000.
Bloasfeld, Lothar, 4,477,965, Cl. 29-576.00B.
Postema, Pieter M., 4,478,387, Cl. 251-121.000.
Ivanov, Alexei A.: *See*—
Matros, Jury S.; Boreskov, Georgy K.; Lakhmostov, Viktor S.; Volkov, Viktor J.; and Ivanov, Alexei A., 4,478,808, Cl. 423-522.000.
Iwakura, Sadao, to Canon Kabushiki Kaisha. Thermal printer. 4,479,132, Cl. 346-76.0PH.
Iwamoto, Kazuo: *See*—
Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, 4,478,917, Cl. 429-33.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Uchida, Seiya; and Ashikaga, koichi, 4,479,085, Cl. 323-280.000.
Iwata, Hiroshi: *See*—
Yamaoka, Tetsuo; and Iwata, Hiroshi, 4,479,076, Cl. 315-241.00P.
Iwato, Noboru: *See*—
Kishida, Kozi; Iwato, Noboru; and Ozeki, Yuji, 4,478,903, Cl. 428-216.000.
J. I. Case Company: *See*—
Natzke, Ronald C.; and Klee, Maurice, 4,478,307, Cl. 180-273.000.
Jabs, Gert: *See*—
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,478,738, Cl. 252-188.310.
Jackson, Norman C., to Standard Products Company, The. Window reveal molding. 4,478,020, Cl. 52-309.130.
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., to Motion Control, Inc. Iontophoretic electrode structure. 4,477,971, Cl. 29-877.000.
Jacobson, Annette M.: *See*—
Neely, James E., Jr.; and Jacobson, Annette M., 4,478,905, Cl. 428-324.000.
Jaffe, Edward E., to Ciba-Geigy Corporation. Manufacture of resin extended pigments. 4,478,968, Cl. 524-88.000.
Jager, Erich: *See*—
Dorenkamp, Richard; Faupel, Werner; Geyer, Gerhard; and Jager, Erich, 4,478,195, Cl. 123-502.000.
James, Ian W. Spraying apparatus. 4,478,176, Cl. 119-159.000.
Jamison, Robert G.: *See*—
Chapin, Charles C.; Conley, James H.; and Jamison, Robert G., 4,478,235, Cl. 137-15.000.
Janecka, Jerry F.: *See*—
Lockett, James F.; Janecka, Jerry F.; and Mehrkam, Thomas O., 4,479,264, Cl. 455-605.000.
Janes, Edward W.: *See*—
Zeller, Albert M.; and Janes, Edward W., 4,478,669, Cl. 156-379.700.
Janome Sewing Machine Co., Ltd.: *See*—
Haayu, Susumu; Kasuga, Noboru; Nomota, Reishi; and Ebata, Yoshikazu, 4,478,161, Cl. 112-155.000.
Janssen Pharmaceutica N.V.: *See*—
Hubele, Adolf; and Riebli, Peter, 4,479,004, Cl. 548-101.000.
Japikse, Cornelis H.: *See*—
Baird, James C.; Japikse, Cornelis H.; and Kussin, Richard F., 4,478,858, Cl. 426-126.000.
Jarvenpaa, Viljo J. Apparatus for removing gaseous components and/or solid impurities from a gaseous fluid flow. 4,478,616, Cl. 55-223.000.
Jean-Claude Robin: *See*—
Ruin, Jean-Pierre, 4,478,331, Cl. 206-334.000.
Jenkins, William K., to Multiplex Company, Inc. Citrus fruit juice dispensing apparatus. 4,478,357, Cl. 222-135.000.
Jensen, Georg W.: *See*—
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,854, Cl. 426-12.000.
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,856, Cl. 426-46.000.
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,939, Cl. 435-200.000.
Alder-Nissen, Jens L.; Gurtler, Henrick; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,940, Cl. 435-209.000.
Jeong, Seo Y.: *See*—
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,478,746, Cl. 260-112.700.
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,478,830, Cl. 424-178.000.
J'espere, Jean-Louis: *See*—
Pittion, Philippe; Andre, Guy; Souillard, Gerald; J'espere, Jean-Louis; and Houte, Bernard, 4,478,381, Cl. 248-71.000.
Jevons, Lyle O., Jr.: *See*—
Loakorn, Richard A.; and Jevons, Lyle O., Jr., 4,479,123, Cl. 340-825.060.
JGR Enterprises, Inc.: *See*—
Kurz, John L.; and Harshbarger, Harry F., 4,478,444, Cl. 292-333.000.
Johansson, Stig, to Feudor S.A. Flow control device for disposable gas lighter. 4,478,570, Cl. 431-344.000.
Johnson, Dell A., to Thiokol Corporation. Dual area nozzle actuating mechanical actuation system. 4,478,040, Cl. 60-225.000.
Johnson, Leonard E., Jr., to L. E. Johnson, Inc. Sliding door frame corner lock. 4,478,006, Cl. 49-410.000.
Johnson Matthey & Company Limited: *See*—
Diwell, Alan F.; and Salathiel, Andrew, 4,478,797, Cl. 423-213.500.
Johnson, Robert G.: *See*—
Bohrer, Philip J.; and Johnson, Robert G., 4,478,077, Cl. 73-204.000.
Johnston, Alan R., to United States of America, National Aeronautics and Space Administration. Focal plane array optical proximity sensor. 4,479,053, Cl. 250-221.000.
Johnston, Howard; and Troxell, Lillian H., to Dow Chemical Company, The. Trifluoromethyl pyridinylthiophenoxy propanoic acids and propanols and derivatives thereof. 4,479,001, Cl. 546-291.000.
Johnston, James L. Log splitter. 4,478,263, Cl. 144-3.00K.
Joly, Jean C.: *See*—
Fruchard, Charles; and Joly, Jean C., 4,478,470, Cl. 339-74.00R.
Jonas, Friedrich; Hocker, Jurgen; and Broich, Bruno, to Bayer Aktiengesellschaft. Complex salts having high electric conductivity. 4,478,751, Cl. 260-396.00N.
Jonelis, John A. Electrostatic precipitator construction having spacers. 4,478,614, Cl. 55-145.000.
Jones, Cynthia G.; and Hill, Cliff O., to Eastman Kodak Company. Dye image transfer film unit with tabular silver halide. 4,478,929, Cl. 430-217.000.
Jones, Elmer R. Dip burn-in socket. 4,478,476, Cl. 339-147.00R.
Jones, Henry F., Jr.: *See*—
De Franco, Philip N.; and Jones, Henry F., Jr., 4,478,321, Cl. 192-53.00E.
Jones, James E.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., 4,479,034, Cl. 179-18.0ES.
Josef Heiss Medizintechnik GmbH: *See*—
Heiss, Volker, 4,478,221, Cl. 128-334.00R.
Juillard, Yves, to Societe Alsacienne de Construction de Materiel Textile. Devices for cutting pile threads in a loom for weaving velvet in a double layer. 4,478,255, Cl. 139-21.000.
Juillard, Yves, to Societe Alsacienne de Construction de Materiel Textile. Device for regulating the tension of warp threads in a weaving loom. 4,478,257, Cl. 139-110.000.
Jujo Paper Co., Ltd.: *See*—
Oshima, Hiroyo; Kojima, Yutaka; Kobayashi, Yukio; Omori, Takashi; and Nagai, Koichi, 4,478,910, Cl. 428-331.000.
Jukes, Christopher E., to Mod-Lok Industries Ltd. Alignment strut for wall structures. 4,477,980, Cl. 33-404.000.
Julseth, Rolf. Fastening device. 4,478,384, Cl. 248-467.000.
Junkosha Co., Ltd.: *See*—
Kato, Hiroshi, 4,478,898, Cl. 428-36.000.
Juntunen, Veikko A.: *See*—
Honkaniemi, Matti E.; Juntunen, Veikko A.; Keinanen, Veli J.; and Mansikka, Urpo J., 4,478,802, Cl. 423-236.000.
Jurgens Maschinenbau GmbH & Co. KG.: *See*—
Burnecke, Manfred; and Nyman, Swen, 4,477,959, Cl. 29-433.000.
Justus, Volker: *See*—
Brixy, Heinz; von Mallinckrodt, Detmar; and Justus, Volker, 4,479,026, Cl. 136-232.000.
Kabbe, Hans-Joachim, to Bayer Aktiengesellschaft. Chroman-4-ones and process for preparing same. 4,479,007, Cl. 549-401.000.
Kabushiki Kaisha BANDAI: *See*—
Harigai, Akinori; Aoki, Shinichi; and Nakayama, Takehisa, 4,477,999, Cl. 446-470.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Mikami, Yoshiharu, 4,478,300, Cl. 177-59.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, 4,478,626, Cl. 65-18.100.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Baba, Kiyokazu, 4,478,320, Cl. 192-48.910.
Kabushiki Kaisha Sakurakurepasu: *See*—
Morio, Yasumasa, 4,478,529, Cl. 401-53.000.
Kabushiki Kaisha Sigma: *See*—
Manabe, Katsuki, 4,478,407, Cl. 272-18.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Aizawa, Hitomi, 4,479,065, Cl. 307-247.00R.
Kackenmeister, Carl F.; and Houseknecht, Gary L., to GTE Products Corporation. Photoflash array humidity protected switches. 4,478,571, Cl. 431-359.000.

Kaeding, Warren W., to Mobil Oil Corporation. Para-selective zeolite catalysts treated with sulfur compounds. 4,478,949, Cl. 502-77.000.
Kahn, Leonard R. Squelch and message storage system and method. 4,479,153, Cl. 360-53.000.
Kai, Masami: *See*—
Miyoshi, Yoshitake; Shibata, Kiyoshi; Watanabe, Toshio; Kai, Masami; and Ohata, Yousuke, 4,478,506, Cl. 355-3.0SH.
Kaiser, Robert G., to Clark & Vicario Corporation. Deaerated liquid stock supply. 4,478,615, Cl. 55-170.000.
Kajikawa, Takashi: *See*—
Edamura, Mizuo; Kajikawa, Takashi; and Okamoto, Koji, 4,478,703, Cl. 204-298.000.
Kakino, Yoshiaki, to Kakino, Yoshiaki; NF Circuit Design Block Co., Ltd.; and Showa Tool Co., Ltd. Device for detecting tool abnormality. 4,478,538, Cl. 408-6.000.
Kaltbeitzer, Dieter: *See*—
Backstein, Gunter; Unger, Hans W.; Gunther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,478,149, Cl. 102-426.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Beier, Stefan, 4,479,182, Cl. 364-413.000.
Kamata, Isao; and Ohyama, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas insulated switching apparatus. 4,479,165, Cl. 361-335.000.
Kamatani, Yoshio: *See*—
Tanaka, Michio; Kamatani, Yoshio; and Nasu, Koji, 4,478,894, Cl. 427-388.200.
Kamei, Kazuo; and Orimoto, Akira, to Pioneer Electronic Corporation. Process for detecting transported and residual tape amounts. 4,479,159, Cl. 360-137.000.
Kamenster, Boris: *See*—
Wells, Lawrence E.; Kamenster, Boris; Fox, Preston R.; and Gill, Jerry A., 4,478,111, Cl. 81-57.190.
Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,478,732, Cl. 252-49.600.
Kamiyama, Yasuo: *See*—
Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, 4,478,524, Cl. 368-204.000.
Kamohara, Eiji: *See*—
Takenaka, Shigeo; and Kamohara, Eiji, 4,478,589, Cl. 445-37.000.
Kamp, Ewald A.: *See*—
Cisek, Kenneth E.; and Kamp, Ewald A., 4,477,950, Cl. 24-30.50P.
Kampf, Richard S.; and Dowling, Henry G., to Beckman Instruments, Inc. Scintillation counter light seal. 4,479,054, Cl. 250-328.000.
Kanatani, Yoshiharu: *See*—
Ohba, Toshihiro; Kawaguchi, Masashi; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,479,120, Cl. 340-781.000.
Kanda, Mutsumi: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,478,182, Cl. 123-188.00M.
Kane, James L., to Eastman Kodak Company. Nip drive for sheet feeding apparatus. 4,478,402, Cl. 271-100.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, 4,478,982, Cl. 525-316.000.
Kaneko, Toshie: *See*—
Koizumi, Yuichiro; and Kaneko, Toshie, 4,479,061, Cl. 250-487.100.
Kaney, Kathryn. Method for recording uncoded scores or ratings by multiple evaluators on a single automatic machine scannable document. 4,478,584, Cl. 434-353.000.
Kanuma, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Priority determination circuit. 4,479,193, Cl. 364-900.000.
Kaplan, Jean-Pierre; and Raizon, Bernard, to Synthelabo. Benzylidene derivatives and compositions containing them. 4,478,851, Cl. 424-330.000.
Karamchetty, Somayajulu D. S. R.: *See*—
Leibowitz, Herman M.; and Karamchetty, Somayajulu D. S. R., 4,478,553, Cl. 416-97.00R.
Karpowycz, Ihor B., to Sun Electric Corporation. Automatic biasing control circuit for emissions detector. 4,479,057, Cl. 250-343.000.
Karwat, Heinz, to Linde Aktiengesellschaft. Prevention of carbonyl formation to avoid fouling of sour gas absorption system. 4,478,798, Cl. 423-224.000.
Kasai, Shoji: *See*—
Maebayashi, Jiro; and Kasai, Shoji, 4,478,430, Cl. 280-690.000.
Kasuga, Noboru: *See*—
Hanyu, Susumu; Kasuga, Noboru; Nomota, Reishi; and Ebata, Yoshikazu, 4,478,161, Cl. 112-155.000.
Kataoka, Tetsuo: *See*—
Horikita, Hiroyuki; and Kataoka, Tetsuo, 4,478,766, Cl. 261-124.000.
Kato, Akinori; and Chujo, Yoshihiro, to Fujitsu Limited; and Toray Industries, Inc. Automatic continuous medium setting device. 4,478,508, Cl. 355-14.00R.
Kato, Hideo: *See*—
Itho, Yasuo; Kato, Hideo; Koshinska, Eiichi; Ogawa, Nobuo; Kurata, Sakae; and Yamagishi, Kagari, 4,478,838, Cl. 424-250.000.
Kato, Hiroshi, to Junkosha Co., Ltd. Laminated porous polytetrafluoroethylene tube and its process of manufacture. 4,478,898, Cl. 428-36.000.
Kato, Kazutaka: *See*—
Kikuchi, Tetsuro; Kato, Masanori; Kato, Masahiko; Kato, Kazutaka; and Kumoi, Tomio, 4,478,181, Cl. 123-145.00A.
Kato, Masahiko: *See*—
Kikuchi, Tetsuro; Kato, Masanori; Kato, Masahiko; Kato, Kazutaka; and Kumoi, Tomio, 4,478,181, Cl. 123-145.00A.
Kato, Masanori: *See*—
Kikuchi, Tetsuro; Kato, Masanori; Kato, Masahiko; Kato, Kazutaka; and Kumoi, Tomio, 4,478,181, Cl. 123-145.00A.
Kato, Masatake, to Canon Kabushiki Kaisha. Zoom lens. 4,478,496, Cl. 350-427.000.
Kato, Yoshiharu: *See*—
Naganoma, Masanori; Kato, Yoshiharu; Saito, Atsunori; Hara, Yoshimichi; and Matsushima, Katsuaki, 4,478,274, Cl. 165-12.000.
Katsuyama, Harumi; Amano, Yoshikazu; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Quantitative analysis film and a method for colorimetric analysis using the same. 4,478,942, Cl. 436-66.000.
Kawada, Yoshihiro: *See*—
Endo, Gen; Hori, Hirokazu; Kawada, Yoshihiro; and Sakai, Junzo, 4,478,775, Cl. 264-40.300.
Kawaguchi, Masashi: *See*—
Ohba, Toshihiro; Kawaguchi, Masashi; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,479,120, Cl. 340-781.000.
Kawahara, Akira: *See*—
Imahashi, Hiromichi; Turuoka, Shigeo; Kuniya, Keiichi; Iizuka, Tomio; and Kawahara, Akira, 4,478,363, Cl. 228-131.000.
Kawahara, Atsushi: *See*—
Azuma, Toru; Hazama, Junji; Kawahara, Atsushi; Hada, Kazunari; and Fujii, Norio, 4,479,145, Cl. 358-106.000.
Kawahara, Eiichiro; and Ikeda, Koichi, to Honda Giken Kogyo Kabushiki Kaisha. Swash plate type hydraulic device. 4,478,134, Cl. 91-488.000.
Kawai, Hisasi: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,479,068, Cl. 310-194.000.
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.
Kawai, Taiyo, to Toyota Jidosha Kabushki Kaisha. Fuel injection timing control in electronically controlled engine. 4,478,190, Cl. 123-478.000.
Kawai, Tohru, to Canon Kabushiki Kaisha. Focus presetting mechanism for a camera lens assembly. 4,478,491, Cl. 350-255.000.
Kawakami, Tomio: *See*—
Ohta, Minoru; Yasuda, Eturo; Kawakami, Tomio; and Kotanshi, Yoichi, 4,478,067, Cl. 73-23.000.
Kawamura, Shinichiro; and Irimajiri, Takahiko, to Hitachi, Ltd. Speaker equipped with diaphragm filled with foamed resin. 4,478,309, Cl. 181-167.000.
Kawana, Hidejiro: *See*—
Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, 4,478,917, Cl. 429-33.000.
Kawanabe, Tsuyoshi, to Canon Kabushiki Kaisha. Electronic device having a thermal ink jet recorder. 4,479,134, Cl. 346-140.00R.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Edamura, Mizuo; Kajikawa, Takashi; and Okamoto, Koji, 4,478,703, Cl. 204-298.000.
Fujikawa, Tetsuzo; and Takada, Toshiyuki, 4,478,180, Cl. 123-59.0BS.
Okuno, Ryuzo; Toyoda, Keio; Sarai, Masahiro; and Takai, Kiyoshi, 4,478,574, Cl. 432-180.000.
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photo-electric conversion device with accumulation time control. 4,479,062, Cl. 250-578.000.
Kawasaki Steel Corp.: *See*—
Kitayama, Hideo; and Niwa, Haruho, 4,478,573, Cl. 432-124.000.
Kawaura, Takayoshi, to Nissan Motor Company, Limited. Elastic support structure of wheel suspension mechanism. 4,478,396, Cl. 267-8.00R.
Kay, John W.: *See*—
Shaffer, Dale A.; Kay, John W.; and Basquin, Maurice H., 4,478,415, Cl. 273-1.50R.
Kazmaier, Gunther; and Goller, Ernst, to H. Stoll GmbH & Co. Take down mechanism for flat knitting machines. 4,478,058, Cl. 66-149.00R.
Keane, John J.; and Zopf, Richard F., to General Electric Company. Process of making a printed circuit using dry film resists. 4,478,932, Cl. 430-314.000.
Keck, Donald B.: *See*—
Blankenship, Michael G.; and Keck, Donald B., 4,478,489, Cl. 350-96.300.
Kee, David F.: *See*—
Hicks, Irwin A.; and Kee, David F., 4,478,079, Cl. 73-253.000.
Keel, Beat G.: *See*—
Kracke, Alan G.; Tran, Tuan P.; and Keel, Beat G., 4,477,968, Cl. 29-603.000.
Keeton, John H. Dual exposure hot wire cutter. 4,478,163, Cl. 112-287.000.
Keinanen, Veli J.: *See*—
Honkaniemi, Matti E.; Juntunen, Veikko A.; Keinanen, Veli J.; and Mansikka, Urpo J., 4,478,802, Cl. 423-236.000.
Keiper U.S.A., Inc.: *See*—
Linde, Peter W., 4,478,455, Cl. 297-362.000.
Keller-Juslen, Camilla; Kuhn, Max; and King, Hamilton D., to Sandoz Ltd. Antibiotics, pharmaceutical compositions and method of use. 4,478,831, Cl. 424-181.000.

Kelley, Edwin L.; Herzberg, Walter J.; and Sinka, Joseph V., to Diamond Shamrock Chemicals Company. Carbonaceous oil slurries stabilized by binary surfactant mixtures. 4,478,602, Cl. 44-51.000.

Kelman, Charles D. Intraocular lens with flexible C-shaped supports. 4,477,931, Cl. 3-13.000.

Kelsey-Hayes Company: *See*—
Rozmus, Walter J.; and Dietrich, Jerry L., 4,478,788, Cl. 419-48.000.

Kemmel, Patrice J.; and Hartwig, Jurgen, to Pfaff Haushaltmaschinen GmbH. Sewing machine with a universal motor. 4,479,077, Cl. 318-245.000.

Kendall Company, The: *See*—
Van Overloop, Ronald R., 4,478,530, Cl. 401-134.000.

Kennedy, John M.; and Kennedy, William R. Mine stopping with man door and door frame assembly. 4,478,535, Cl. 405-132.000.

Kennedy, William R.: *See*—
Kennedy, John M.; and Kennedy, William R., 4,478,535, Cl. 405-132.000.

Kernforschungsanlage Julich GmbH: *See*—
Brixy, Heinz; von Mallinckrodt, Detmar; and Justus, Volker, 4,479,026, Cl. 136-232.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Krevet, Berthold; Schauer, Wolfgang; and Wuchner, Fritz, 4,478,877, Cl. 427-62.000.

Kerr, John P., to Canadair Limited. Unmanned remotely piloted aircraft. 4,478,379, Cl. 244-17.110.

Kerr-McGee Chemical Corporation: *See*—
Coleman, Tommy W.; and Griffin, Robert A., 4,478,697, Cl. 204-105.00M.
Puri, Avinash D.; Rodosevich, James B.; and Fairchild, James L., 4,478,599, Cl. 23-300.000.

Kervennal, Jacques; Cognion, Jean-Marie; and Braunstein, Pierre, to Produits Chimiques Ugine Kuhlmann. Process for the manufacture of aromatic isocyanates. 4,478,757, Cl. 260-453.0PC.

Kessler, Milton. Apparatus for mixing and blending constituents of a flow of thermoplastics material. 4,478,516, Cl. 366-87.000.

Kestes, Arthur S.; and Couch, Harold T., to United Technologies Corporation. Gas transporting system. 4,478,814, Cl. 423-650.000.

Ketterer, Leonard R.: *See*—
Levinson, Dale A.; and Ketterer, Leonard R., 4,478,531, Cl. 403-77.000.

Khaja, Farees U.; Ernest, Robert O.; Gronwick, Jerry P.; and Bristol, Howard A., to Sunbeam Corporation. Split barrel electric hair curler/styler. 4,479,047, Cl. 219-225.000.

Khoe, Giok D.; Van Leest, Johannes H. F. M.; and Meuleman, Lambertus J., to U.S. Philips Corporation. Connector for coupling at least one optical fiber to a further optical element. 4,478,485, Cl. 350-96.200.

Khoobiar, Sargis, to Halcon SD Group, Inc., The. Catalyst and process for unsaturated aldehydes. 4,479,013, Cl. 568-479.000.

Khoobiar, Sargis, to Halcon SD Group, Inc., The. Conversion of isobutane to methacrolein. 4,479,014, Cl. 568-479.000.

Kiboku, Mituo: *See*—
Kuwahara, Toshide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, 4,478,643, Cl. 106-288.00Q.

Kida, Makoto: *See*—
Kikuchi, Masakazu; Hayakawa, Takaki; and Kida, Makoto, 4,478,937, Cl. 435-172.300.

Kidd, H. Keith; and Coulon, Philip S., Jr., to Kollmorgen Technologies Corporation. Brushless motor controller. 4,479,078, Cl. 318-254.000.

Kidde Recreation Products, Inc.: *See*—
Hayes, Gerald G., 4,478,203, Cl. 124-24.00R.

Kifer, Edward W.: *See*—
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., 4,478,958, Cl. 521-121.000.

Kikkawa, Ikuo: *See*—
Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,478,997, Cl. 544-71.000.

Kikuchi, Masakazu; Hayakawa, Takaki; and Kida, Makoto. Plasmid and production thereof. 4,478,937, Cl. 435-172.300.

Kikuchi, Tetsuro; Kato, Masanori; Kato, Masahiko; Kato, Kazutaka; and Kumoi, Tomio, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. After glow control system for engine. 4,478,181, Cl. 123-145.00A.

Kikumoto, Tadao, to Roland Corporation. Sound aspect generating apparatus for an electronic musical instrument. 4,478,124, Cl. 84-1.190.

Kim, Wan S.; Jeong, Seo Y.; and McRea, James C. Glycosylated insulin derivatives. 4,478,746, Cl. 260-112.700.

Kim, Wan S.; Jeong, Seo Y.; and McRea, James C. Glycosylated insulin derivatives. 4,478,830, Cl. 424-178.000.

Kim, Wontaik, to General Electric Company. Convergent hot cone process for thermoset molding. 4,478,780, Cl. 264-328.200.

Kimberly-Clark Corporation: *See*—
Notheis, Patrick J., 4,478,354, Cl. 221-34.000.

Kinbara, Hiroji: *See*—
Hayakawa, Hideyuki; Matsui, Kazuma; Hattori, Yoshiyuki; and Kinbara, Hiroji, 4,478,595, Cl. 474-109.000.

King, Hamilton D.: *See*—
Keller-Jusles, Camilla; Kuhn, Max; and King, Hamilton D., 4,478,831, Cl. 424-181.000.

King, Larry K.: *See*—
Schoener, Ronald C.; King, Larry K.; Knap, Lester L.; and Kloap, Nicholas, 4,478,600, Cl. 23-313.0FB.

King, Robert W., to Copeland Corporation. Valve assembly. 4,478,243, Cl. 137-512.100.

King, William F., to Chevron Research Company. Pesticidal O-(N-alkoxy-substituted-benzimidoyl)-phosphorus esters and thioesters. 4,478,832, Cl. 424-210.000.

Kingsbury, Paul I.: *See*—
Adair, Peter J.; Hobczuk, Michael P.; Kingsbury, Paul I.; and Nelson, John W., 4,478,641, Cl. 106-110.000.

Kinoshita, Hiroshi: *See*—
Ohba, Toshihiro; Kawaguchi, Masashi; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,479,120, Cl. 340-781.000.

Kinoshita, Kenzi; Niimi, Yukihide; and Urushidani, Masahiro, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control system for internal combustion engines. 4,478,191, Cl. 123-489.000.

Kinoshita, Kenzi; Niimi, Yukihide; Urushidani, Masahiro; and Ohnaka, Hidemi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control system for internal combustion engines. 4,478,192, Cl. 123-489.000.

Kinoshita, Tomoo. Reclaiming machine for scraps of expanded foam thermoplastic material. 4,479,048, Cl. 219-388.000.

Kioritz Corporation: *See*—
Nagashima, Akira; and Kondo, Tadashige, 4,478,200, Cl. 123-605.000.

Kipchakvaev, Alexandr D.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Kirby, George J.: *See*—
Lusignea, Richard W.; Kirby, George J.; and Mariano, Charles F., 4,477,977, Cl. 33-178.00R.

Kish, Robert J.: *See*—
Knight, Donn C.; Kish, Robert J.; and Fox, Albert D., 4,478,390, Cl. 254-270.000.

Kishida, Eiji: *See*—
Narasaka, Shin; Otsuka, Kazuo; and Kishida, Eiji, 4,478,199, Cl. 123-571.000.

Kishida, Kozi; Iwato, Noboru; and Ozeki, Yuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Composite plastics sheet having conductive surface. 4,478,903, Cl. 428-216.000.

Kitamura, Takashi, to Canon Kabushiki Kaisha. Method of and apparatus for regulating the quantity of light of an array-like light source. 4,479,221, Cl. 372-31.000.

Kitao, Kohji: *See*—
Kohno, Kiyoshi; Nishikawa, Satoshi; Hattori, Yoshiya; and Kitao, Kohji, 4,478,990, Cl. 526-279.000.

Kitayama, Hideo; and Niwa, Haruho, to Chugai Ro Co., Ltd.; and Kawasaki Steel Corp. Furnace for heating pipes with upset portions. 4,478,573, Cl. 432-124.000.

Kitayama, Seishi: *See*—
Yamamoto, Seiichi; and Kitayama, Seishi, 4,479,036, Cl. 179-170.200.

Kitterman, Lawrence: *See*—
Slater, Glenn L.; Weiler, Gerhard H.; Turoff, Robert; and Kitterman, Lawrence, 4,478,342, Cl. 215-32.000.

Kiuchi, Seiji: *See*—
Sakaguchi, Masaaki; Satoh, Shinichi; Kiuchi, Seiji; and Chikamasa, Hiroshi, 4,478,376, Cl. 242-191.000.

Klaassen, Lambertus G. M., to De Rotterdamsche Droogdok MIJ B.V. Industrial vehicle having an adjustable and pivotal armrest. 4,478,308, Cl. 180-326.000.

Klahr, Erhard; Rebafka, Walter; Nissen, Axel; Trieselt, Wolfgang; and Hettche, Albert, to BASF Aktiengesellschaft. Ethoxylates of diacetylene alcohols and the use of these compounds as surfactants. 4,479,016, Cl. 568-606.000.

Klancnik, John H. Set of dark slides for use with a zone exposure system. 4,478,501, Cl. 354-125.000.

Klee, Maurice: *See*—
Natzke, Ronald C.; and Klee, Maurice, 4,478,307, Cl. 180-273.000.

Klein, George D., to Texaco Canada Resources Ltd. Spacer for deep wells. 4,478,278, Cl. 166-105.000.

Klem, Charles D.: *See*—
Frische, Richard H.; Dankwort, Rudolf C.; and Klem, Charles D., 4,479,070, Cl. 310-338.000.

Kleschick, William A., to Dow Chemical Company, The. Selective preparation of isomers and enantiomers of cyclopropane carboxylic acids. 4,479,005, Cl. 548-230.000.

Kleykamp, Donald L.: *See*—
Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., 4,478,154, Cl. 105-225.000.

Klietsch, Bernd-Juergen; Kollmeier, Hans-Joachim; Lammerting, Helmut; and Langenhagen, Rolf-Dieter, to Th. Goldschmidt AG. Process for the production of highly resilient, cold-curing polyurethane foams. 4,478,957, Cl. 521-112.000.

Kloap, Nicholas: *See*—
Schoener, Ronald C.; King, Larry K.; Knap, Lester L.; and Kloap, Nicholas, 4,478,600, Cl. 23-313.0FB.

Klocker, Heinz, to Gebr. Klocker (Klocker Bros.). Apparatus for producing a selvage provided with a crossweave. 4,478,256, Cl. 139-54.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Hafner, Karl E.; and Kohler, Wolfgang, 4,478,196, Cl. 123-504.000.

Knab, Rochus: *See—*
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; Schramm, Herbert; and Viess, Walter, 4,478,068, Cl. 73-35.000.

Knap, Lester L.: *See—*
Schoener, Ronald C.; King, Larry K.; Knap, Lester L.; and Kloap, Nicholas, 4,478,600, Cl. 23-313.0FB.

Knapp, Philip B. Method for making fertilizer cartridge. 4,477,960, Cl. 29-458.000.

Knight, Donn C.; Kish, Robert J.; and Fox, Albert D., to D. W. Zimmerman Mfg., Inc. Fluid-operated apparatus for handling and lifting loads. 4,478,390, Cl. 254-270.000.

Knochel, E. Stanley. Device for checking bills of currency to detect bills which are stuck together. 4,477,974, Cl. 33-168.00R.

Kobavashi, Robert J.; and Byrne, Joe L., to Garrett Corporation, The. Method for controlling the operation of an hydraulic assist turbocharger. 4,478,043, Cl. 60-608.000.

Kobayashi, Atsushi: *See—*
Nojima, Minejiro; Kobayashi, Makiji; and Kobayashi, Atsushi, 4,479,191, Cl. 364-707.000.

Kobayashi, Hiroshi, to Nissan Motor Company, Limited. Capacitive type fuel level and impurity indicator. 4,479,116, Cl. 340-620.000.

Kobayashi, Makiji: *See—*
Nojima, Minejiro; Kobayashi, Makiji; and Kobayashi, Atsushi, 4,479,191, Cl. 364-707.000.

Kobayashi, Makoto: *See—*
Ohta, Shigenori; Inoue, Seijiro; Torigoe, Takaoki; and Kobayashi, Makoto, 4,478,866, Cl. 426-549.000.

Kobayashi, Yukio: *See—*
Oshima, Hiroyo; Kojima, Yutaka; Kobayashi, Yukio; Omori, Takashi; and Nagai, Koichi, 4,478,910, Cl. 428-331.000.

Kobelt, Jacob. Twin lever control assembly. 4,478,109, Cl. 74-878.000.

Kobinger, Walter: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; and Stockhaus, Klaus, 4,478,844, Cl. 424-273.00R.

Koch, Bernhard, to Grob & Co. Aktiengesellschaft. Warp stop motion device of a weaving machine. 4,478,258, Cl. 139-358.000.

Koch, Ronald N.; and Yanov, David A., to Rockwell International Corporation. Threaded pipe coupling. 4,478,440, Cl. 285-392.000.

Kochndorfer, Michael; Kurtz, Rudiger; Meurer, Werner; Seider, Werner; and Storr, Helmut, to Escher Wyss GmbH. Papermaking machine stock trim deflecting device. 4,478,684, Cl. 162-337.000.

Kochs Adler AG: *See—*
Bierweller, Gerhard, 4,478,162, Cl. 112-227.000.

Kocsan, Joseph A. System of a bow stabilizer and an embedded arrow head remover. 4,478,204, Cl. 124-89.000.

Kocsisek, Karl: *See—*
Aarts, Petrus J. J.; Fleck, Harald; and Kocsisek, Karl, 4,479,157, Cl. 360-104.000.

Koester, Charles J. Axial scanning optical system and method of examining an object plane. 4,478,482, Cl. 350-6.600.

Koga, Tsuguaki: *See—*
Sato, Ichiya; Yoneyama, Takao; Koga, Tsuguaki; Ikeuchi, Kazuo; and Hisano, Katsukuni, 4,478,082, Cl. 73-593.000.

Kohama, Tokio: *See—*
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.

Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Ink recording apparatus. 4,479,135, Cl. 346-140.00R.

Kohler Co.: *See—*
Fleischmann, Gary A., 4,478,249, Cl. 137-625.400.

Kohler, Wolfgang: *See—*
Hafner, Karl E.; and Kohler, Wolfgang, 4,478,196, Cl. 123-504.000.

Kohno, Kiyoshi; Nishikawa, Satoshi; Hattori, Yoshiya; and Kitao, Kohji, to Sunstar Giken Kabushiki Kaisha. Room temperature curing elastic composition. 4,478,990, Cl. 526-279.000.

Koike, Akihiko: *See—*
Yamato, Akihiro; Koike, Akihiko; Hosokawa, Takehiko; and Maruyama, Nobutoshi, 4,478,194, Cl. 123-491.000.

Koizumi, Shigeo: *See—*
Shiba, Keisuke; Nakao, Sho; and Koizumi, Shigeo, 4,478,930, Cl. 430-271.000.

Koizumi, Takashi: *See—*
Nishikawa, Yasuhisa; Tanaka, Yoshio; Hasumi, Ryoichi; and Koizumi, Takashi, 4,478,098, Cl. 74-10.330.

Koizumi, Yuichiro; and Kaneko, Toshie, to Canon Kabushiki Kaisha. Luminance amplifier and an apparatus including the same. 4,479,061, Cl. 250-487.100.

Koizumi, Yuji: *See—*
Okada, Minoru; Sone, Takeo; Sakamoto, Shigeru; Koizumi, Yuji; and Tsuda, Iwao, 4,478,541, Cl. 409-232.000.

Kojima, Keiichi: *See—*
Ishise, Kojiro; and Kojima, Keiichi, 4,479,031, Cl. 174-73.00R.

Kojima, Yutaka: *See—*
Oshima, Hiroyo; Kojima, Yutaka; Kobayashi, Yukio; Omori, Takashi; and Nagai, Koichi, 4,478,910, Cl. 428-331.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Yamamoto, Seiichi; and Kitayama, Seishi, 4,479,036, Cl. 179-170.200.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See—*
Shimizu, Keiichi, 4,478,445, Cl. 292-336.300.

Kollmeier, Hans-Joachim: *See—*
Klietsch, Bernd-Juergen; Kollmeier, Hans-Joachim; Lammerting, Helmut; and Langenhagen, Rolf-Dieter, 4,478,957, Cl. 521-112.000.

Kollmorgen Technologies Corporation: *See—*
Kidd, H. Keith; and Coulon, Philip S., Jr., 4,479,078, Cl. 318-254.000.

Komma, Gerhard; and Lohse, Dietmar, to Mannesmann Demag AG. Apparatus for thermal longitudinal parting of rectangular metal plate bars, in particular of cut-to-length continuous-casting plate slabs. 4,478,393, Cl. 266-49.000.

Kommrusch, Richard S.: *See—*
Batlivala, Percy P.; and Kommrusch, Richard S., 4,479,245, Cl. 455-18.000.

Kondo, Asaji: *See—*
Katsuyama, Harumi; Amano, Yoshikazu; and Kondo, Asaji, 4,478,942, Cl. 436-66.000.

Kondo, Tadashige: *See—*
Nagashima, Akira; and Kondo, Tadashige, 4,478,200, Cl. 123-605.000.

Kong-Chan, Josephine L. Y., to Procter & Gamble Company, The. Preparation of phenyl esters in the presence of boric anhydride. 4,478,754, Cl. 260-410.500.

Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Mullner, Hubert, to Hoechst Aktiengesellschaft. Nonapeptide having immunostimulative activity, process for the preparation thereof, and its use. 4,478,828, Cl. 424-177.000.

Koning, Gerrit; and Bergveld, Piet, to Cordis Europa N.V. Electrochemical sensing apparatus with in situ calibration. 4,478,222, Cl. 128-632.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Haneda, Satoshi; and Itaya, Masahiko, 4,478,870, Cl. 427-14.100.
Ishiguro, Yasuo, 4,478,500, Cl. 354-443.000.

Konyn, Dale R.; and Zielke, Wayne T. Gardening tool. 4,478,033, Cl. 56-400.060.

Kooijmans, Petrus G.: *See—*
Bekooij, Jurrianus; Raudenbusch, Werner T.; Stachowiak, Stephen A.; Kooijmans, Petrus G.; and Scholten, Henricus P. H., 4,478,985, Cl. 525-530.000.

Kopecko, William J.: *See—*
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Koppe, Herbert: *See—*
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Kopper Company, Inc.: *See—*
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., 4,478,958, Cl. 521-121.000.

Koppers Company, Inc.: *See—*
Leston, Gerd, 4,479,019, Cl. 568-709.000.

Korf, Rainer: *See—*
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Koshinaka, Eiichi: *See—*
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Kosswig, Kurt: *See—*
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Koster, William H.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. 2-Oxo-1-(substituted phosphorous)azetidines. 4,478,749, Cl. 260-245.400.

Kotani, Takeshi: *See—*
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,478,182, Cl. 123-188.00M.

Kotanshi, Yoichi: *See—*
Ohta, Minoru; Yasuda, Eturo; Kawakami, Tomio; and Kotanshi, Yoichi, 4,478,067, Cl. 73-23.000.

Kotera, Takuro: *See—*
Yano, Nobuyuki; Kotera, Takuro; Aoki, Akira; and Utagawa, Toshio, 4,478,053, Cl. 62-262.000.

Kovach, Nickolas C. Fence protector. 4,478,391, Cl. 256-1.000.

Koverya, Vladimir M.: *See—*
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Koziol, Walter, to Modern Home Products Corp. Dual adjustable gas intake assembly. 4,478,205, Cl. 126-25.00R.

Kracke, Alan G.; Tran, Tuan P.; and Keel, Beat G., to Magnetic Peripherals Inc. Method for using a machining sensor. 4,477,968, Cl. 29-603.000.

Krambeck, Robert H.; and Shoji, Masakazu, to AT&T Bell Laboratories. Skew-free clock circuit for integrated circuit chip. 4,479,216, Cl. 371-61.000.

Krause, Walter P.: *See—*
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Kreidl, Werner H.: *See—*
Bailey, J. Milton; Alexeff, Igor; and Kreidl, Werner H., 4,479,103, Cl. 335-229.000.

Krevet, Berthold; Schauer, Wolfgang; and Wuchner, Fritz, to Kernforschungszentrum Karlsruhe GmbH. Process for the preparation of superconducting compound materials. 4,478,877, Cl. 427-62.000.

Krieger, Charles F.: *See—*
Fogg, M. Charles; Krieger, Charles F.; and Veale, John R., 4,479,194, Cl. 364-900.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See—*
Gau, George, 4,478,668, Cl. 156-364.000.

Krude, Werner; and Muller, Karl-Heinz, to Uni-Cardan Aktiengesellschaft. Universal joint sealing assembly. 4,478,592, Cl. 464-173.000.
Krueger, William M. Workpiece support structure. 4,478,397, Cl. 269-170.000.
Kruger, Albert; and Healey, Richard, to Metallurgical Processes Limited; and I. S. C. Smelting Limited. Roasting of mixed sulphide ores or concentrates. 4,478,794, Cl. 423-89.000.
KRW Energy Systems Inc.: *See*—
Everett, James W., 4,478,253, Cl. 138-140.000.
KSM Fastening Systems Inc.: *See*—
Wilkinson, Harold C.; Pease, Charles C.; and Wall, Kevin, 4,478,022, Cl. 52-509.000.
Kuder, James E.; and East, Anthony J., to Celanese Corporation. Erasable recording medium comprising a dimer acid polyamide resin. 4,478,782, Cl. 264-345.000.
Kuhn, Max: *See*—
Keller-Juslen, Camilla; Kuhn, Max; and King, Hamilton D., 4,478,831, Cl. 424-181.000.
Kumada, Akio: *See*—
Shimada, Tamotsu; Kumada, Akio; Tokinaga, Daizo; Shinbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,478,217, Cl. 128-303.100.
Kumagai, Munehito; and Suzuki, Shigehisa, to Mitsubishi Denki Kabushiki Kaisha. Magnetic disk recorder. 4,479,156, Cl. 360-104.000.
Kummer, Werner: *See*—
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Kumoi, Tomio: *See*—
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Kuniya, Keiichi: *See*—
Imahashi, Hiromichi; Tsuzuoka, Shigeo; Kuniya, Keiichi; Iizuka, Tomio; and Kawahara, Akira, 4,478,363, Cl. 228-131.000.
Kuno, Akira: *See*—
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Kuo, Clinton C. K., to Motorola, Inc. Electrically erasable programmable read only memory cell. 4,479,203, Cl. 365-218.000.
Kuramoto, Takeo, to W. R. Grace K.K. Surface treating agent. 4,478,885, Cl. 427-144.000.
Kurata, Masami, to Fuji Xerox Co., Ltd. Dichromatic reading device. 4,479,242, Cl. 382-17.000.
Kurata, Sakae: *See*—
Itho, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; and Yamagishi, Kagari, 4,478,838, Cl. 424-250.000.
Kurihara, Masaru; Harumiya, Noriho; and Uemura, Tadahiro, to Toray Industries, Inc. Semipermeable membrane treated with modified vinyl polymer. 4,478,717, Cl. 210-500.200.
Kuroda Precision Industries Ltd.: *See*—
Suzuki, Sigeru, 4,477,976, Cl. 33-169.00R.
Kuroiwa, Hiroshi: *See*—
Oyama, Yoshishige; Kuroiwa, Hiroshi; and Nishimura, Yutaka, 4,478,075, Cl. 73-118.200.
Kurosaki Refractories Co., Ltd.: *See*—
Fuzii, Koichiro, 4,478,392, Cl. 266-44.000.
Kurtgis, Michael P. System and portable cage for servicing power transmission lines. 4,478,312, Cl. 182-142.000.
Kurtz, Rudiger: *See*—
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Kurz, John L.; and Harshbarger, Harry F., to JGR Enterprises, Inc. Door bolt immobilizing device. 4,478,444, Cl. 292-333.000.
Kussin, Richard F.: *See*—
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Kuwahara, Toshide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, to Gakko Hojin Kinki Daigaku; and Nippon Paint Co., Ltd. Base composition comprising an irradiated organic pigment. 4,478,643, Cl. 106-288.00Q.
Kuwakado, Satosi: *See*—
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, 4,478,433, Cl. 280-807.000.
Kuwata, Masayoshi; and Urbaetis, Stanley P., to General Electric Company. Apparatus and method for cleaning a fluidized bed gas distributor. 4,478,646, Cl. 134-7.000.
Kwon, Joon T.: *See*—
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., 4,479,020, Cl. 568-850.000.
Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
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L. & C. Steinmuller GmbH: *See*—
Bloss, Wolfgang; and Mohn, Ulrich, 4,478,810, Cl. 423-555.000.
Dorling, Rolf; and Premel, Ulrich, 4,478,606, Cl. 48-77.000.
Dorling, Rolf; and Premel, Ulrich, 4,478,608, Cl. 48-210.000.
L. E. Johnson, Inc.: *See*—
Johnson, Leonard E., Jr., 4,478,006, Cl. 49-410.000.
Laauwe, Robert H.: *See*—
Roggenburg, Stanley L., Jr.; and Laauwe, Robert H., 4,478,356, Cl. 222-94.000.
Ladeur, Bernhard H.: *See*—
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Lakhmostov, Viktor S.: *See*—
Matros, Jury S.; Boreskov, Georgy K.; Lakhmostov, Viktor S.; Volkov, Viktor J.; and Ivanov, Alexei A., 4,478,808, Cl. 423-522.000.
Lal, Joginder; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Blends of higher alpha-olefin polymers and 1,2-epoxide polymers. 4,478,980, Cl. 525-187.000.
Lalancette, Jean M.; and Drolet, Jean P., to Societe Nationale de Lisiamante. Production of magnesium oxide from magnesium silicates by basic extraction of silica. 4,478,796, Cl. 423-155.000.
Lambert, Joe C., to General Electric Company. Electrical braking control for DC motors. 4,479,080, Cl. 318-373.000.
Lambert, Scott M., to Emhart Industries, Inc. Bottom plate retainer. 4,478,630, Cl. 65-242.000.
Lammerting, Helmut: *See*—
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Lamont, William D. Medical boot apparatus, and methods of constructing and utilizing same. 4,478,214, Cl. 128-149.000.
Landaburu, Ricardo H.; Yue, Robert H.; Farb, David L.; and Violand, Bernard N., to Armour Pharmaceutical Company. Pharmaceutical preparation containing purified fibronectin. 4,478,829, Cl. 424-177.000.
Landis & Gyr Aug AG: *See*—
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Landler, Josef; and Mayr, Max, to Alkor GmbH Kunststoffverkauf. Method of placing a decorative layer on a carrier panel. 4,478,660, Cl. 156-78.000.
Lane, Edward S., to United Kingdom Atomic Energy Authority. Preparation of materials. 4,478,812, Cl. 423-618.000.
Lanfermann, Willy, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Longwall mining apparatus for working thick seams. 4,478,457, Cl. 299-18.000.
Lang, Curtis E.; and Roe, Robert J., to Lang, Curtis E. Apparatus for baiting longline fishing gear. 4,477,992, Cl. 43-4.000.
Langan, Richard A., to Union Carbide Corporation. Manganese carbonate additive for manganese dioxide-containing nonaqueous cells. 4,478,921, Cl. 429-194.000.
Langenhagen, Rolf-Dieter: *See*—
Klietsch, Bernd-Juergen; Kollmeier, Hans-Joachim; Lammerting, Helmut; and Langenhagen, Rolf-Dieter, 4,478,957, Cl. 521-112.000.
Langer, Horst G.; and Fellmann, Jere D., to Dow Chemical Company, The. Preparation of high purity berlinite. 4,478,805, Cl. 423-311.000.
Langlitz, Karlheinz: *See*—
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Lantry, Gerald F. Dispensing closure mechanism for resiliently squeezable receptacles. 4,478,358, Cl. 222-213.000.
Lapointe, Joseph A., deceased; and by Lapointe, June, executrix. Chip thickness separator. 4,478,374, Cl. 241-261.200.
Lapointe, June, executrix: *See*—
Lapointe, Joseph A., deceased; and Lapointe, June, executrix, 4,478,374, Cl. 241-261.200.
Larson, David N.; Ireland, Jeffrey; and Terry, Michael B., to Mostek Corporation. Low voltage, low power RC oscillator circuit. 4,479,097, Cl. 331-111.000.
Larson, Duane B., to Bethlehem Steel Corporation. Adaptive control for a dividing shear. 4,478,119, Cl. 83-42.000.
Lawhon, Joel E.: *See*—
Miller, Leigh G.; and Lawhon, Joel E., 4,479,180, Cl. 364-200.000.
Lawrence, Larry K.; and Grisaffi, John J. Cable sling arrangement for pivoting a drilling mast and drawworks elevator to a raised or reclined position in relation to a substructure support and method of cable sling string up. 4,478,015, Cl. 52-120.000.
LeaRonal, Inc.: *See*—
Nobel, Fred I., 4,478,692, Cl. 204-43.00R.
Leath, Richard: *See*—
Salomaa, Kari; Merrill, Roy; Leath, Richard; Wennberg, Timothy; and Widunas, Joseph, 4,478,094, Cl. 73-863.320.
Lecacheux, Didier; Lesec, James; and Prechner, Roland, to Societe Nationale Elf Aquitaine. Viscosimeter operating continuously especially at high temperature. 4,478,071, Cl. 073-55.000.
Leckie, Franklin J. Toilet seat closure. 4,477,933, Cl. 4-253.000.
Ledley, Robert S.; and Zapolski, Edward J., to Georgetown University. Rare earth/chelating agent complex for digital fluoroscopy. 4,478,816, Cl. 424-4.000.
Lee, Do I.; and Mundorf, Traute, to Dow Chemical Company, The. Heterogeneous polymer latex of relatively hard and relatively soft interpolymers of a monovinylidene aromatic monomer and an aliphatic conjugated diene monomer. 4,478,974, Cl. 524-533.000.
Lee, Gim F., Jr.: *See*—
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,478,979, Cl. 525-68.000.
Lee, Wai-Nang P.; Harpen, Michael D.; and Siegel, Jeffry A. Method for evaluating thyroid function. 4,478,945, Cl. 436-500.000.
Le Fur, Gerard R.: *See*—
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LeGlue, Michael J.; and deBoer, Nico, to McDermott Incorporated. Jacking apparatus adjustable for alignment variations. 4,478,389, Cl. 254-108.000.
Legrand S.A.: *See*—
Durand, Guy; and Roby, Gerard, 4,478,478, Cl. 339-263.00R.
Leiber, Heinz, to Robert Bosch GmbH. Hydraulic dual-circuit servo brake apparatus. 4,478,461, Cl. 303-92.000.
Leibowitz, Herman M.; and Karamchetty, Somayajulu D. S. R., to Mechanical Technology Incorporated. Isothermal compression. 4,478,553, Cl. 416-97.00R.

Lemke, Winfred R.: *See*—
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Lenk, Pedro A.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., 4,479,034, Cl. 179-18.0ES.

Lenosky, Theodore, to Maddak, Inc. Raised superimposed toilet seat and securing clamp. 4,477,932, Cl. 4-239.000.

Leonard, Henri, to Micro-Mega S.A. Handle for dental canal rotary instrument and method of manufacturing same. 4,478,578, Cl. 433-165.000.

Leppink, Arie: *See*—
Eertink, Bastiaan B. B.; and Leppink, Arie, 4,478,405, Cl. 271-227.000.

Lesec, James: *See*—
Lecacheux, Didier; Lesec, James; and Prechner, Roland, 4,478,071, Cl. 073-55.000.

Lesniak, Lawrence F.: *See*—
Vetter, Ronald F.; Gerrish, Howard W., Jr.; and Lesniak, Lawrence F., 4,478,151, Cl. 102-481.000.

Leston, Gerd, to Koppers Company, Inc. Complex formed to separate nitrated phenolic compounds from other phenolic compounds. 4,479,019, Cl. 568-709.000.

Leutner, Volkmar: *See*—
Heiser, Joachim; Leutner, Volkmar; Schuttenberg, Eckard; and Weigle, Dieter, 4,478,136, Cl. 91-506.000.

Levasseur, Joseph L., to H. R. Electronics Company. Vendor control system. 4,478,353, Cl. 221-14.000.

Lever Brothers Company: *See*—
Cook, Norman, 4,478,348, Cl. 220-318.000.
Oakes, John, 4,478,733, Cl. 252-99.000.

Levinson, Dale A.; and Ketterer, Leonard R., to Moog Automotive, Inc. Rack and pinion ball joint assembly. 4,478,531, Cl. 403-77.000.

Lewis, Arthur M.; and Scudo, Aldo, to Exxon Research & Engineering Co. Cleaning system and method for ink jet printer. 4,479,136, Cl. 346-140.00R.

Lewis, Charles M., to Dayco Corporation. Method of making a reinforced collapsible hose construction. 4,478,661, Cl. 156-92.000.

Lewis, Don W.: *See*—
Cheshier, Charles L.; and Lewis, Don W., 4,478,435, Cl. 285-39.000.

Lhommeau, Robert E.; and Ducruy Guy R., to Indumat S.A. Apparatus for upwardly extruding and cooling a thermoplastic resin multiple tube structure. 4,478,563, Cl. 425-71.000.

Lia, Herman; and Solhjell, Erik, to Tandberg Data A/S. Magnetic recording of digital signals on a magnetic medium. 4,479,151, Cl. 360-46.000.

Liang, Wei C., to Union Carbide Corporation. Carbamate-carbamoyl fluoride compounds. 4,479,002, Cl. 546-335.000.

Liermann, Peter; Hesse, Karl-Heinz; Meyer, Dietmar; and Gudat, Wolfgang, to WABCO Fahrzeugbremsen GmbH. Electro-pneumatic door control apparatus. 4,478,131, Cl. 91-356.000.

Lightner, Roy W., to Marion Laboratories, Inc. Method for recovering the contents of filled pharmaceutical capsules. 4,478,118, Cl. 83-24.000.

Lignes Telegraphiques & Telephoniques: *See*—
Auzet, Christian; Rusch, Daniel; and Chabernaud, Daniel, 4,479,230, Cl. 375-108.000.

Lin, Ching H. Versatile pocket-size container. 4,478,330, Cl. 206-38.000.

Lina, Marie-Jose : *See*—
Dessaint, Andre L.; and Lina, Marie-Jose , 4,478,975, Cl. 524-871.000.

Linde Aktiengesellschaft: *See*—
Bengeser, Georg; and Ranke, Gerhard, 4,478,799, Cl. 423-224.000.
Fabian, Rainer, 4,478,621, Cl. 62-31.000.
Karwat, Heinz, 4,478,798, Cl. 423-224.000.

Linde, Peter W., to Keiper U.S.A., Inc. Hollow eccentric bolt for taumel hinge fitting. 4,478,455, Cl. 297-362.000.

Linder, Ernst: *See*—
Brettschneider, Johannes; Dobler, Klaus; Haag, Gottlob; Linder, Ernst; and Polach, Wilhelm, 4,478,613, Cl. 55-127.000.

Lindstrom, Erik A.: *See*—
Honeycutt, Fred L., Jr.; and Lindstrom, Erik A., 4,478,551, Cl. 415-142.000.

Lion Corporation: *See*—
Yazaki, Mitsuyoshi; Tanaka, Hideo; and Nakamura, Masayoshi, 4,478,735, Cl. 252-135.000.

Lipton, Jan, to Concast AG. Method for continuous casting of steel strands, especially slabs. 4,478,272, Cl. 164-454.000.

Liqui-Box Corporation: *See*—
Bond, Curtis J., 4,478,242, Cl. 137-383.000.

Little, Gerald R. Hose mender device. 4,478,434, Cl. 285-15.000.

Littmann, Martin F., to Armco Inc. Process for producing grain-oriented silicon steel. 4,478,653, Cl. 148-111.000.

Litton Industrial Products, Inc.: *See*—
Dunn, Elman R., 4,478,008, Cl. 51-111.00R.

Litton Systems, Inc.: *See*—
Belt, Roger F.; and Uhrin, Robert, 4,478,676, Cl. 156-616.00R.
Pulliam, George R., 4,478,872, Cl. 427-38.000.

Lobo, Edward M.; and Hunter, Donald F. Wound capacitor end connections and method of obtaining same. 4,477,953, Cl. 29-25.420.

Loch, David M., to Boeing Company, The. Automated alternating polarity direct current pulse electrolytic processing of metals. 4,478,689, Cl. 204-14.100.

Lockard, Joseph L., to AMP Incorporated. Light emitting diode assembly. 4,478,588, Cl. 445-22.000.

Lockett, James F.; Janecka, Jerry F.; and Mehrkam, Thomas O., to Geosource Inc. Transducer for optical data transmission. 4,479,264, Cl. 455-605.000.

Loev, Bernard: *See*—
Shroff, James R.; and Loev, Bernard, 4,478,834, Cl. 424-246.000.

Loew, Gunther: *See*—
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,478,738, Cl. 252-188.310.

Lohmann GmbH & Co. KG: *See*—
Barth, Peter; and Blaudszun, Bernd, 4,478,686, Cl. 203-49.000.

Lohse, Dietmar: *See*—
Komma, Gerhard; and Lohse, Dietmar, 4,478,393, Cl. 266-49.000.

Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Floppy diskette storage container and display device. 4,478,335, Cl. 206-444.000.

Look, Raymond J., to AMP Incorporated. Method of manufacturing flat peelable cable. 4,478,778, Cl. 264-146.000.

Lorant, Stefan, to United Stirling AB. Cylinder liner-regenerator unit for a hot gas engine. 4,478,042, Cl. 60-526.000.

Lorenz, Renate: *See*—
Fischer, Wolfgang; Gehre, Gerhard; Korf, Rainer; Lorenz, Renate; and Taschner, Heinz, 4,478,579, Cl. 433-222.000.

Loskorn, Richard A.; and Jevons, Lyle O., Jr., to Burroughs Corporation. Automatic Calling Unit control system. 4,479,123, Cl. 340-825.060.

Lothmann, Josef: *See*—
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, 4,478,129, Cl. 91-1.000.

Lotz, Helmut, to Bosch-Siemens Hausgeraete GmbH. Continuously operating an adsorption refrigeration plant, especially for operation by waste heat of combustion engines or the like. 4,478,057, Cl. 62-480.000.

Loughlin, Bernard D., to Hazeltine Corporation. Distortion correcting AM stereo receiver with non-flat AGC. 4,479,233, Cl. 381-15.000.

Loveland, Robert S., to Perkin-Elmer Corporation, The. Flowmeter system with ultrasonic energy improvement in equilibration. 4,478,088, Cl. 73-861.280.

Lovins, Robert E.: *See*—
Mezei, Louis M.; Chen, Jung S.; Huang, John J.; and Lovins, Robert E., 4,478,744, Cl. 260-112.50R.

Lucas Industries: *See*—
Fenne, Ivor, 4,478,189, Cl. 123-467.000.
Forrester, John S., 4,478,091, Cl. 73-862.540.

Ludwig, Daniel P.: *See*—
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,249, Cl. 455-208.000.
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,255, Cl. 455-246.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Rotter, Gerhard, 4,478,326, Cl. 192-106.200.

Lukasczyk, Wolfgang; and Ewald, Roland, to Mannesmann Rexroth GmbH. Pressure control valve. 4,478,250, Cl. 137-625.650.

Luke, John A., to Brown & Williamson Tobacco Corporation. Smoke filters. 4,478,229, Cl. 131-336.000.

Lummus Company, The: *See*—
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., 4,479,020, Cl. 568-850.000.

Luntz, Richard D.: *See*—
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., 4,477,971, Cl. 29-877.000.

Lusignea, Richard W.; Kirby, George J.; and Mariano, Charles F., to Foster-Miller, Inc. Method and apparatus involving the measurement of bores. 4,477,977, Cl. 33-178.00R.

Lust, Sigmund: *See*—
Becher, Heinz-Manfred; Drandarevski, Christo A.; and Lust, Sigmund, 4,478,852, Cl. 424-322.000.

Lux, Gerard J-M.: *See*—
Baugh, Benton F.; Lux, Gerard J-M.; and Ribeyre, Jean-Paul, 4,478,292, Cl. 173-149.000.

Lynchak, Kima A.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Lyon, Lyman R., to Microdot Inc. Blind rivet. 4,478,543, Cl. 411-34.000.

Lyons, James E.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,478,752, Cl. 260-396.00R.

Lyons, William J. Drawstring fastener. 4,477,947, Cl. 24-115.00F.

M/A-COM DCC, Inc.: *See*—
Buschman, Bob D.; Muth, Glenn D.; and O'Connell, Ronald T., 4,479,142, Cl. 358-13.000.

M.D. Industries, Inc.: *See*—
Wiestmiller, K. Joyce, 4,478,332, Cl. 206-361.000.

M.G.S. Mfg. Inc.: *See*—
Williams, Dean L., 4,478,034, Cl. 57-58.340.

Maass, Wolfgang: *See*—
Haendle, Joerg; and Maass, Wolfgang, 4,479,231, Cl. 378-99.000.

Mack, Mark P.; and Berge, Charles T., to Du Pont de Nemours, E. I., and Company. Supported catalyst for olefin polymerization. 4,478,952, Cl. 502-110.000.

Mackal, Glenn H. Inflatable boat valve and mounting therefor. 4,478,587, Cl. 441-41.000.

MacMillan, Bloedel Limited: *See*—
Barnes, Derek; Dessens, Jan A. H.; and Rosenberg, George N., 4,478,896, Cl. 427-421.000.

Maddak, Inc.: *See*—
Lenosky, Theodore, 4,477,932, Cl. 4-239.000.

Maddox, James W.; and Berger, David D., to United States of America, Energy. Condensate removal device. 4,478,238, Cl. 137-171.000.

Madey, John M. J. Excitation cancelling free electron laser. 4,479,219, Cl. 372-2.000.

Madsen, Craig C.; Stewart, Daniel B.; and Andree, James, to Burroughs Corporation. Photo-optical switch apparatus. 4,479,111, Cl. 340-365.00P.

Maebayashi, Jiro; and Kasai, Shoji, to Toyo Kogyo Co., Ltd. Strut type vehicle suspension mechanism. 4,478,430, Cl. 280-690.000.

Maezono, Masakazu: *See*—
Nishimura, Sadanori; and Maezono, Masakazu, 4,478,108, Cl. 74-866.000.

MAFAG AG fur Feinmechanik: *See*—
Mafli, Reinald, 4,477,946, Cl. 24-5.000.

Mafli, Reinald, to MAFAG AG fur Feinmechanik. Device for receiving and fixing a flower. 4,477,946, Cl. 24-5.000.

Magid, David J., to Enviro-Spray Systems, Inc. Inflatable pouch and method of manufacture. 4,478,044, Cl. 60-721.000.

Magidman, Paul: *See*—
Heiland, Wolfgang K.; and Magidman, Paul, 4,478,096, Cl. 73-864.730.

Magnavox Company, The: *See*—
Caspari, Frederick W.; Smith, Bruce E.; and Heuer, Daniel A., 4,479,248, Cl. 455-183.000.

Magnetic Peripherals Inc.: *See*—
Kracke, Alan G.; Tran, Tuan P.; and Keel, Beat G., 4,477,968, Cl. 29-603.000.

Maguire, Dennis D.: *See*—
Sperry, John A.; and Maguire, Dennis D., 4,478,977, Cl. 525-61.000.

Maier, Josef. Climbing forms. 4,478,385, Cl. 249-20.000.

Maiers, Richard D. Football type board game. 4,478,419, Cl. 273-259.000.

Maijer, Rolf; and Starck, James W., to Romada Holdings Ltd. Orthodontic attachment placement device. 4,478,576, Cl. 433-3.000.

Mains, Gregg B. Side arm baton and flashlight. 4,479,171, Cl. 362-102.000.

Makami, Ryuzo; and Nakamura, Akito, to Toray Silicone Co., Ltd. Method of manufacture of silicone elastomer coated cloth. 4,478,895, Cl. 427-407.300.

Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, to Mitsubishi Chemical Industries Limited. Process for preparing bisphenols using pyridinealkanethiol derivatized sulphonated cation exchange resins. 4,478,956, Cl. 521-32.000.

Malin, Herbert: *See*—
Dickens, David R.; Smith, Waldo; and Malin, Herbert, 4,478,901, Cl. 428-120.000.

Mallen Fuentes, Jose M.: *See*—
Navarro, Carlos R.; and Mallen Fuentes, Jose M., 4,478,271, Cl. 164-426.000.

Malmstrom, Rolf E.: *See*—
Aaltonen, Olavi A.; Malmstrom, Rolf E.; Nermes, Esko O.; and Tuominen, Tapio K., 4,478,394, Cl. 266-162.000.

Maloof, Ferris A. Cap printing system. 4,478,144, Cl. 101-126.000.

MAN Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Zeilinger, Hans; Muhlratzer, August; and Stemmler, Bruno, 4,478,648, Cl. 148-6.300.

Manabe, Katsuki, to Kabushiki Kaisha Sigma. Monitor game machine. 4,478,407, Cl. 272-18.000.

Mandigo, Frank N.: *See*—
Brock, Andrew J.; and Mandigo, Frank N., 4,478,651, Cl. 148-31.500.

Mangiavacchi, Jacques, to Glaenzer Spicer. Lubricating device, in particular for a universal joint spider. 4,478,591, Cl. 464-14.000.

Mannesmann Aktiengesellschaft: *See*—
Ackermann, Wilhelm; and Langlitz, Karlheinz, 4,478,102, Cl. 74-410.000.
Hendrischk, Wolfgang; and Nolte, Gerhard, 4,478,143, Cl. 101-93.050.
Hess, Walter; Nicolai, Franz; Treiss, Erich; and Gotting, Otto, 4,479,043, Cl. 219-8.500.

Mannesmann Demag AG: *See*—
Komma, Gerhard; and Lohse, Dietmar, 4,478,393, Cl. 266-49.000.

Mannesmann Rexroth GmbH: *See*—
Lukaszyk, Wolfgang; and Ewald, Roland, 4,478,250, Cl. 137-625.650.

Mansikka, Urpo J.: *See*—
Honkaniemi, Matti E.; Juntunen, Veikko A.; Keinanen, Veli J.; and Mansikka, Urpo J., 4,478,802, Cl. 423-236.000.

Mansson, Bjorn: *See*—
Helgesson, Gote; Mansson, Bjorn; and Wallin, Nils-Hakan, 4,478,966, Cl. 524-13.000.

Manville Service Corporation: *See*—
Graser, Earl J., 4,478,334, Cl. 206-427.000.

Maoka, Tadanori: *See*—
Ueno, Mitsuhi; Maoka, Tadanori; Murata, Kenji; and Shirogami, Tamotsu, 4,478,918, Cl. 429-38.000.

Mapes, Glenn H.: *See*—
Wood, Charles L.; Mapes, Glenn H.; and Daudt, Stephen W., 4,478,629, Cl. 65-163.000.

Marathon Oil Company: *See*—
Sydansk, Robert D., 4,478,283, Cl. 166-292.000.

Marcinowski, Stefan: *See*—
Goertz, Hans-Helmut; Marcinowski, Stefan; and Sanner, Axel, 4,478,976, Cl. 525-54.100.

Marhold, Werner; and Pool, Danny J., to Cal-Tron Corporation. Mode conditioned joystick control for video games. 4,479,038, Cl. 200-6.00A.

Mariano, Charles F.: *See*—
Lusignea, Richard W.; Kirby, George J.; and Mariano, Charles F., 4,477,977, Cl. 33-178.00R.

Maricle, Donald L.; Putnam, Gary C.; and Stewart, Robert C., Jr. Method of making molten carbonate fuel cell ceramic matrix tape. 4,478,776, Cl. 264-83.000.

Marien, August M.: *See*—
Van Gossum, Lucien J.; Marien, August M.; De Winter, Walter F.; and Van Thillo, Etienne A., 4,478,907, Cl. 428-327.000.

Marien, Kenneth J.; and Lemke, Winfred R., to Square D Company. Machine tool relay structure. 4,479,102, Cl. 335-132.000.

Marino, Casadei: *See*—
Giulio, Folli; and Marino, Casadei, 4,478,569, Cl. 425-324.100.

Marion Laboratories, Inc.: *See*—
Lightner, Roy W., 4,478,118, Cl. 83-24.000.

Mark, Seymour, to Standard Oil Company, The. Coal-aqueous mixtures comprising nonionic and anionic surfactants. 4,478,603, Cl. 44-51.000.

Markovich, Voya: *See*—
Bupp, James R.; Markovich, Voya; Napp, Tracy E.; and Sambucetti, Carlos J., 4,478,883, Cl. 427-97.000.

Markovsky, Evgeny A.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Marlett, Everett M., to Ethyl Corporation. Production of complex beryllium hydrides. 4,478,813, Cl. 423-644.000.

Marouf, Mohamed A.: *See*—
Bass, Ann H.; Blaschak, Jeffery G.; Marouf, Mohamed A.; Vancil, Paul W.; and Winchell, David F., 4,479,211, Cl. 370-62.000.

Marquardt, Walter L., to Eaton Corporation. Add-on state indicator for an enclosed D.C. power relay. 4,479,117, Cl. 340-644.000.

Mars Limited: *See*—
Ariss, Stephen A.; Measures, John C.; and Barker, David, 4,478,868, Cl. 426-641.000.

Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., to BL Technology Limited. Method of, and apparatus for, detecting leaks. 4,477,986, Cl. 73-40.700.

Marshall, Winston S.: *See*—
Fleisch, Jerome H.; Marshall, Winston S.; and Cullinan, George J., 4,478,820, Cl. 424-45.000.

Martin, Edward J. Safety lock on entrance door. 4,478,442, Cl. 292-248.000.

Martin, Eugene G.; and Risser, Dale M., to Victor F. Weaver, Inc. Poultry breast de-boning machine and processing method. 4,477,942, Cl. 17-11.000.

Martin, Henry, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,478,756, Cl. 260-429.700.

Martin, Jerome L.: *See*—
Williams, Robert D.; Bright, David R.; Young, Vernon V.; and Martin, Jerome L., 4,478,935, Cl. 435-75.000.

Martin, Lee R., II. Rear suspension for a three wheel vehicle. 4,478,305, Cl. 180-215.000.

Martin Marietta Corporation: *See*—
Hogan, Tanai N.; and Woods, James A., 4,478,001, Cl. 49-37.000.

Marty, Claude; and Engelhard, Philippe, to Compagnie Francaise de Raffinage. Process for the oligomerization of light olefin fractions in the presence of a boron trifluoride catalyst. 4,479,023, Cl. 585-312.000.

Martyniuk, Ernest T.: *See*—
Bly, Kenneth B.; Chmiel, Edward J.; and Martyniuk, Ernest T., 4,478,618, Cl. 55-314.000.

Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Process for preparation of coated plastic container. 4,478,889, Cl. 427-230.000.

Maruyama, Nobutoshi: *See*—
Yamato, Akihiro; Koike, Akihiko; Hosokawa, Takehiko; and Maruyama, Nobutoshi, 4,478,194, Cl. 123-491.000.

Marx, Matthias: *See*—
Buethe, Ingolf; Marx, Matthias; Schleier, Gisbert; and Peters, Reinhard, 4,478,960, Cl. 521-160.000.

Mary, Irene: *See*—
Hercelin, Bernard; Mary, Irene; and Nung, Vien N., 4,478,819, Cl. 424-37.000.

Maryland Cup Corporation: *See*—
Ritter, Frank; and Balordi, Romano, 4,478,121, Cl. 83-209.000.

MAS Mfg. Corp.: *See*—
Caldwell, Donald B., 4,478,285, Cl. 166-311.000.

Maschinenfabrik Lauffer GmbH & Co. KG.: *See*—
Plocher, Werner, 4,478,673, Cl. 156-498.000.

Mascioli, Rocco L.: *See*—
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,478,959, Cl. 521-124.000.

Mason, Ted D.: *See*—
Cena, Lawrence; and Mason, Ted D., 4,478,155, Cl. 105-355.000.

Massachusetts Institute of Technology: *See*—
Rediker, Robert H., 4,479,224, Cl. 372-92.000.
Whitesides, George M.; Hirschbein, Bernard L.; and Mazenod, Francois P., 4,478,762, Cl. 260-983.000.

Massey-Ferguson Services N.V.: *See*—
De Franco, Philip N.; and Jones, Henry F., Jr., 4,478,321, Cl. 192-53.00E.
Page, Ronald C.; and Smith, Derek J., 4,478,104, Cl. 74-479.000.

Masso, Jon D.; Brennan, William D.; and Rotenberg, Don H., to American Optical Corporation. Method imparting anti-static, anti-reflective properties to ophthalmic lenses. 4,478,873, Cl. 427-40.000.

Masuyama, Tetsuo: *See*—
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,478,956, Cl. 521-32.000.

Mathad, Gangadhara S.: *See*—
Chen, Lee; Chuang, Tung J.; and Mathad, Gangadhara S., 4,478,677, Cl. 156-635.000.

Mathieu, Julien C.: *See*—
Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., 4,478,154, Cl. 105-225.000.

Mathis, Ronald D.: *See*—
Reed, Jerry O.; and Mathis, Ronald D., 4,478,969, Cl. 524-106.000.

Matros, Jury S.; Boreskov, Georgy K.; Lakhmostov, Viktor S.; Volkov, Viktor J.; and Ivanov, Alexei A., to Institut Kataliza Sibirskogo Otdelenia Akademii Nauk SSSR. Method of producing sulphur trioxide. 4,478,808, Cl. 423-522.000.

Matsuda, Itsuaki: *See*—
Adachi, Takeshi; Takeshita, Tetsuo; and Matsuda, Itsuaki, 4,478,680, Cl. 162-103.000.

Matsui, Kazuma: *See*—
Hayakawa, Hideyuki; Matsui, Kazuma; Hattori, Yoshiyuki; and Kinbara, Hiroji, 4,478,595, Cl. 474-109.000.
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,478,550, Cl. 415-53.00T.

Matsumura, Shoichi; Hashimoto, Yoshihiko; Furukawa, Hiroyasu; and Azuma, Masaaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. High nitrile content based resin and method of producing the same. 4,478,982, Cl. 525-316.000.

Matsuoka, Hideoki; and Yamamoto, Yoshimi, to Nissan Motor Company, Limited. Locking structure for a seat belt slider in a mounting rail. 4,478,432, Cl. 280-804.000.

Matsushima, Katsuaki: *See*—
Naganoma, Masanori; Kato, Yoshiharu; Saito, Atsunori; Hara, Yoshimichi; and Matsushima, Katsuaki, 4,478,274, Cl. 165-12.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,478,753, Cl. 260-396.00N.
Kohashi, Tadao, 4,479,135, Cl. 346-140.00R.

Matte, Louis G.: *See*—
Siniscal, Paul D.; Benzing, J. Paige; and Matte, Louis G., 4,478,327, Cl. 193-40.000.

Mattisson, Sven, to Inventab Audio Kb. Amplifier having high common mode rejection. 4,479,093, Cl. 330-258.000.

Mattsson, Stig, to Frosta Fritid AB. Protective helmet. 4,477,929, Cl. 2-425.000.

Maul, Rudolf: *See*—
Isler, Heinz; and Maul, Rudolf, 4,479,021, Cl. 568-868.000.

Max-Planck-Gesellschaft Zur Foerderung Der Wissenschaften e.V.: *See*—
Bor, Zsolt; and Schafer, Fritz P., 4,479,220, Cl. 372-25.000.

Mayer, Sigmund: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,478,948, Cl. 502-25.000.

Mayoral, Joaquin: *See*—
Vofsi, David; Reich, Shymon; Tchoukran, Israel; and Mayoral, Joaquin, 4,478,770, Cl. 264-2.100.

Mayr, Max: *See*—
Landler, Josef; and Mayr, Max, 4,478,660, Cl. 156-78.000.

Maytag Company, The: *See*—
Cotton, Curran D., 4,477,982, Cl. 34-48.000.

Mayumi, Yoshishige; Satoh, Kenzoh; Hasegawa, Kenji; and Takahashi, Mitsuyoshi, to Showa Denko Kabushiki Kaisha. Seat core members or partition plates for vehicles formed from synthetic resin. 4,478,899, Cl. 428-72.000.

Mazaris, George A.: *See*—
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Mazelie, Yves. Lighter forming an extinguishing ash-tray. 4,478,230, Cl. 131-234.000.

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Frater, Norman K.; Hoo, Stanley S.; and McConnell, William H., 4,479,090, Cl. 324-454.000.

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LeGlue, Michael J.; and deBoer, Nico, 4,478,389, Cl. 254-108.000.

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Herr, Francis V.; Walklet, Thomas B.; Hansen, James G.; Hasler, Theodore J.; Beil, Valentin; Donlon, Harold E.; and Christian, Ken E., 4,478,339, Cl. 211-126.000.

McDowell, Robert A. Food storage receptacle for use in automotive vehicle. 4,478,052, Cl. 62-244.000.

McElhannon, Gordon W. Automatic nailing apparatus. 4,478,361, Cl. 227-7.000.

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Sanchez, Ruben; and McEver, R. M., Jr., 4,478,251, Cl. 138-44.000.

McFarland, Robert A. Dynamometer controllers. 4,478,090, Cl. 73-862.090.

McGard, Inc.: *See*—
Flexman, C. Hight, 4,478,458, Cl. 301-9.0SC.

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McConnaughey, Paul W.; and McKee, Elmer S., 4,478,792, Cl. 422-56.000.

McKenna, Charles E., to Univ. of Southern California. Process for preparing alpha-fluorinated alkanediphosphonates. 4,478,763, Cl. 260-986.000.

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Miller, Claud T.; and Miller, Larry W., 4,478,264, Cl. 144-83.000.

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Skinner, David R.; Stokes, Rex A.; Freeman, Lewis O.; and McNeill, Alan R., 4,478,513, Cl. 356-323.000.

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Hoppie, Lyle O.; McNinch, Joseph H., Jr.; and Nowell, Gregory C., 4,478,777, Cl. 264-102.000.

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Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,478,746, Cl. 260-112.700.
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Ariss, Stephen A.; Measures, John C.; and Barker, David, 4,478,868, Cl. 426-641.000.

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Leibowitz, Herman M.; and Karamchetty, Somayajulu D. S. R., 4,478,553, Cl. 416-97.00R.

Medetec Industries, Inc.: *See*—
Houman, Leif, 4,478,355, Cl. 222-54.000.

Medichem, S.A.: *See*—
Almenara, Manuel A., 4,478,996, Cl. 544-49.000.

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Clark, Leonard R.; and Meehl, David W., 4,478,466, Cl. 312-215.000.

Mefford, Ray W. Piston-removing apparatus. 4,477,956, Cl. 29-252.000.

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Melgoza, Raymond. Apparatus for planting seeds and the like. 4,478,159, Cl. 111-52.000.

Menear, Michael J. Wind-propelled craft. 4,478,164, Cl. 114-39.000.

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Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, 4,478,220, Cl. 128-326.000.

Mercer, Mark J. Quick insertion and release bolt system. 4,478,546, Cl. 411-385.000.

Merck & Co., Inc.: *See*—
Haslam, John L.; Higuchi, Takeru; and Mlodozeniec, Arthur R., 4,478,822, Cl. 424-78.000.
Veber, Daniel F.; and Boger, Joshua S., 4,478,826, Cl. 424-177.000.

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Eidenschink, Rudolf; Eichler, Jurgen; and Weber, Georg, 4,478,740, Cl. 252-299.620.

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Vedvik, Andrew H.; and Merdler, Myron J., 4,478,024, Cl. 53-473.000.
Mergner, George C., to General Signal Corporation. Temperature compensation for zero and span changes in a measurement circuit. 4,478,527, Cl. 374-172.000.
Mericle, Robert W., to Ethicon, Inc. Ligating clip and applier instrument therefor with clip engaging escapement. 4,478,218, Cl. 128-325.000.
Merrill, Roy: *See—*
Salomaa, Kari; Merrill, Roy; Leath, Richard; Wennberg, Timothy; and Widunas, Joseph, 4,478,094, Cl. 73-863.320.
Messier-Hispano-Bugatti(s.a.): *See—*
Schott, Marcel, 4,478,557, Cl. 417-271.000.
Metallurgical Processes Limited: *See—*
Kruger, Albert; and Healey, Richard, 4,478,794, Cl. 423-89.000.
Metallwerk Max Brose GmbH & Co.: *See—*
Hess, Peter; Muhling, Gunter; and Schust, Gerhard, 4,478,099, Cl. 74-11.000.
Metalogic Control Limited: *See—*
Grimshaw, Kenneth P., 4,479,176, Cl. 364-148.000.
Meth, Sheldon Z.: *See—*
Friedlander, Marc A.; and Meth, Sheldon Z., 4,479,199, Cl. 365-119.000.
Metz, Reinhard: *See—*
Herr, Diane E.; Metz, Reinhard; and Russell, Larry A., 4,479,195, Cl. 364-900.000.
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Khoe, Giok D.; Van Leest, Johannes H. F. M.; and Meuleman, Lambertus J., 4,478,485, Cl. 350-96.200.
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Kochndorfer, Michael; Kurtz, Rudiger; Meurer, Werner; Seider, Werner; and Storr, Helmut, 4,478,684, Cl. 162-337.000.
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Liermann, Peter; Hesse, Karl-Heinz; Meyer, Dietmar; and Gudat, Wolfgang, 4,478,131, Cl. 91-356.000.
Meyer, Hans R.; and Morf, Max, to Ciba-Geigy Corporation. Amphoteric styrene derivatives useful as fluorescent brighteners. 4,478,598, Cl. 8-648.000.
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, to Ciba-Geigy Corporation. N-Arylsulfonyl-N'-pyrimidinylureas. 4,478,635, Cl. 71-92.000.
Mezei, Louis M.; Chen, Jung S.; Huang, John J.; and Lovins, Robert E., to Sherwood Medical Company. Method of obtaining antibodies. 4,478,744, Cl. 260-112.50R.
Mibae, Jiro: *See—*
Taniguchi, Takashi; and Mibae, Jiro, 4,478,909, Cl. 428-331.000.
Michaels, Donald D., Jr., to Carrier Corporation. Economizer control assembly for regulating the volume flow of outdoor ambient air. 4,478,056, Cl. 62-332.000.
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Michelson, Paul E. Delivery system for physiologically active agents. 4,478,596, Cl. 604-890.000.
Michigan Disposal, Inc.: *See—*
Tomyn, Walter W., 4,478,518, Cl. 366-156.000.
Micro Component Technology, Inc.: *See—*
Amundson, Arlon J.; and Wurscher, Robert J., 4,478,352, Cl. 221-13.000.
Micro Control Systems, Inc.: *See—*
Davies, David L., 4,477,973, Cl. 33-1.0CC.
Micro-Mega S.A.: *See—*
Leonard, Henri, 4,478,578, Cl. 433-165.000.
Microdent Industries: *See—*
Puro, Nicholas S., 4,478,532, Cl. 403-157.000.
Microdot Inc.: *See—*
Lyon, Lyman R., 4,478,543, Cl. 411-34.000.
Strand, Norman S., 4,478,544, Cl. 411-34.000.
Middlebusher, Duane L.: *See—*
Bradley, Martin P. T.; Miller, Leslie A.; McCall, Thomas J.; and Middlebusher, Duane L., 4,478,095, Cl. 73-864.210.
Mihara, Shinichi, to Olympus Optical Co., Ltd. Attachment lens system. 4,478,497, Cl. 350-476.000.
Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Device for preventing sticking of weighed material. 4,478,300, Cl. 177-59.000.
Mikkelsen, Henrik, to Folkmar, Jan. Bag for use in the shaping of liquid food products of stimulants, and a method and an apparatus for use in the production of the bag. 4,478,386, Cl. 249-83.000.
Miller, Bernhard: *See—*
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Miller, Claud T.; and Miller, Larry W., to McKnight-Miller Company, Inc. Mortising apparatus. 4,478,264, Cl. 144-83.000.
Miller, David G., to Hewlett-Packard Company. Lead attachment for an acoustic transducer. 4,479,069, Cl. 310-334.000.
Miller, J. Wayne: *See—*
Hake, Lewis W.; Huff, Charles F.; and Miller, J. Wayne, 4,478,298, Cl. 175-329.000.
Miller, James H.: *See—*
Diaz, Zaida; and Miller, James H., 4,478,612, Cl. 55-29.000.
Miller, Larry W.: *See—*
Miller, Claud T.; and Miller, Larry W., 4,478,264, Cl. 144-83.000.
Miller, Leigh G.; and Lawhon, Joel E., to Westinghouse Electric Corp. Digital memory system utilizing fast and slow address dependent access cycles. 4,479,180, Cl. 364-200.000.
Miller, Leslie A.: *See—*
Bradley, Martin P. T.; Miller, Leslie A.; McCall, Thomas J.; and Middlebusher, Duane L., 4,478,095, Cl. 73-864.210.
Miller, William R.: *See—*
McNeilly, David R.; and Miller, William R., 4,479,113, Cl. 340-501.000.
Milliken Research Corporation: *See—*
Inman, Billy E., 4,477,957, Cl. 29-402.080.
Pittman, Edgar H., 4,478,036, Cl. 57-283.000.
Milton Roy Company: *See—*
Goodnight, Lyman E., Jr., 4,478,715, Cl. 210-198.200.
Mine Safety Appliances Company: *See—*
McConnaughey, Paul W.; and McKee, Elmer S., 4,478,792, Cl. 422-56.000.
Minezaki, Shigehiro: *See—*
Nakagawa, Kenichi; Minezaki, Shigehiro; and Funada, Fumiaki, 4,478,741, Cl. 252-299.630.
Minnesota Mining and Manufacturing Company: *See—*
Eian, Gilbert L.; and Trend, John E., 4,478,967, Cl. 524-86.000.
Fleisher, Larry D., 4,478,477, Cl. 339-198.00G.
Foslien, Floyd L., 4,478,362, Cl. 227-19.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ando, Makoto, 4,478,492, Cl. 350-257.000.
Nakai, Masaaki, 4,478,502, Cl. 354-416.000.
Tanaka, Atsuyuki, 4,478,504, Cl. 355-1.000.
Mirro Corporation: *See—*
Haverland, Walter K., Jr.; and Haverland, Patricia L., 4,478,349, Cl. 220-410.000.
Misch, Wolfgang; Freytag, Adolf; and Henning, Manfred, to Robert Bosch GmbH. Idling speed control for internal combustion engines. 4,478,183, Cl. 123-339.000.
Mischlau, Karl-Hermann: *See—*
Buchler, Wilhelm; and Mischlau, Karl-Hermann, 4,478,773, Cl. 264-31.000.
Miskinis, Edward T., to Eastman Kodak Company. Method of preparing carrier particles for electrographic magnetic brush dry development. 4,478,925, Cl. 430-137.000.
Misono, Shinji; and Suzuki, Hiroaki, to Tokai Carbon Co., Ltd. Rubber composition containing furnace carbon black. 4,478,973, Cl. 524-496.000.
Mistyurik, John D., to Monarch Marking Systems, Inc. Method of coupling ink roller cartridge using pivotable cover. 4,478,145, Cl. 101-205.000.
Mistyurik, John D., to Monarch Marking Systems, Inc. Ink roller support with pivotable cover. 4,478,146, Cl. 101-205.000.
Mita Industrial Company Limited: *See—*
Miyoshi, Hideo; Umeda, Tadashi; and Aoki, Takashi, 4,478,507, Cl. 355-3.00R.
Miyoshi, Yoshitake; Shibata, Kiyoshi; Watanabe, Toshio; Kai, Masami; and Ohata, Yousuke, 4,478,506, Cl. 355-3.0SH.
Mitani, Hisashi: *See—*
Saito, Hidefumi; Hayashi, Munehiro; Mitani, Hisashi; Isaka, Hiromu; and Andoh, Masanao, 4,478,046, Cl. 62-6.000.
Mitchell, Everett E.: *See—*
Welch, Patrick G.; and Mitchell, Everett E., 4,478,701, Cl. 204-298.000.
Mitchell, William O.; Frost, Walter W.; and Hamilton, C. Ray, to Oxford Industries, Inc. Method of forming and inserting collar stays. 4,478,359, Cl. 223-002.000.
Mitral Medical International, Inc.: *See—*
Totten, Robert P.; Totten, Gail S.; and Wilson, Mary A., 4,477,930, Cl. 3-1.500.
Mitsubishi Chemical Industries Limited: *See—*
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,478,956, Cl. 521-32.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Asayama, Yoshiaki, 4,478,087, Cl. 73-861.220.
Kumagai, Munehito; and Suzuki, Shigehisa, 4,479,156, Cl. 360-104.000.
Mizuno, Masanori; and Mizuno, Takaji, 4,479,046, Cl. 219-130.320.
Muramatsu, Kikuo, 4,479,154, Cl. 360-69.000.
Nomura, Masami, 4,478,315, Cl. 187-29.00R.
Ohniwa, Kohichi, 4,478,160, Cl. 112-121.120.
Wada, Shunichi, 4,478,074, Cl. 73-118.200.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Ayusawa, Tadashi; Aoki, Tadamichi; and Nomura, Yutaka, 4,479,017, Cl. 568-613.000.
Mitsui, Hideo, to Tokyo Seat Kabushiki-Kaisha. Means for adjustably supporting headrest of automotive seat. 4,478,456, Cl. 297-410.000.
Miyake, Ichio: *See—*
Tsubota, Nobuyoshi; and Miyake, Ichio, 4,477,927, Cl. 2-19.000.
Miyanaga, Junichi: *See—*
Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, 4,478,626, Cl. 65-18.100.
Miyatake, Hideaki, to Victor Company of Japan, Limited. Signal pickup device for capacitance disk records. 4,479,208, Cl. 369-43.000.
Miyatake, Shigehiro: *See—*
Watanabe, Takashi; and Miyatake, Shigehiro, 4,479,143, Cl. 358-44.000.

Miyauchi, Yoshio, to Dainippon Screen Manufacturing Co., Ltd. Film delivery and positioning device. 4,478,511, Cl. 355-28.000.

Miyoshi, Hideo; Umeda, Tadashi; and Aoki, Takashi, to Mita Industrial Company Limited. Mount for rotary drum in an electrostatic copying apparatus. 4,478,507, Cl. 355-3.00R.

Miyoshi, Tadahiko; Yoshikawa, Masanori; and Taguchi, Mitsuo, to Hitachi, Ltd. Gas detection device. 4,478,704, Cl. 204-412.000.

Miyoshi, Takeshi: *See*—
Ogino, Keizo; Takehara, Masshiro; Miyoshi, Takeshi; and Sagawa, Koichiro, 4,478,734, Cl. 252-117.000.

Miyoshi, Yoshitake; Shibata, Kiyoshi; Watanabe, Toshio; Kai, Masami; and Ohata, Yousuke, to Mita Industrial Company Limited. Electrostatic copying apparatus having improved copy sheet transfer arrangement. 4,478,506, Cl. 355-3.0SH.

Mizuno, Chiaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,478,908, Cl. 428-327.000.

Mizuno Corporation: *See*—
Tsubota, Nobuyoshi; and Miyake, Ichio, 4,477,927, Cl. 2-19.000.

Mizuno, Masanori; and Mizuno, Takaji, to Mitsubishi Denki Kabushiki Kaisha. Single power source arc welding apparatus. 4,479,046, Cl. 219-130.320.

Mizuno, Takaji: *See*—
Mizuno, Masanori; and Mizuno, Takaji, 4,479,046, Cl. 219-130.320.

Mizuno, Toshiaki: *See*—
Takao, Mitsunori; and Mizuno, Toshiaki, 4,479,186, Cl. 364-431.050.

Mizusawa, Akira; and Notoya, Yoshiaki, to Nifco Inc. Fastening device for panels or the like. 4,478,545, Cl. 411-57.000.

Mlodozeniec, Arthur R.: *See*—
Haslam, John L.; Higuchi, Takeru; and Mlodozeniec, Arthur R., 4,478,822, Cl. 424-78.000.

Mobay Chemical Corporation: *See*—
Carter, Russell P., Jr., 4,478,964, Cl. 523-216.000.

Mobil Oil Corporation: *See*—
Chu, Pochen, 4,478,950, Cl. 502-85.000.
Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; and Wada, William T., 4,478,586, Cl. 441-4.000.
Gray, William C., 4,479,205, Cl. 367-63.000.
Hopkins, Daniel N.; and Snavely, Earl S., 4,478,280, Cl. 166-260.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,478,732, Cl. 252-49.600.
Kaeding, Warren W., 4,478,949, Cl. 502-77.000.
Yan, Tsoung-Yuan, 4,478,709, Cl. 208-257.000.

Mod-Lok Industries Ltd.: *See*—
Jukes, Christopher E., 4,477,980, Cl. 33-404.000.

Mod, William A.: *See*—
Ezzell, Bobby R.; Carl, William P.; and Mod, William A., 4,478,695, Cl. 204-98.000.

Modern Home Products Corp.: *See*—
Koziol, Walter, 4,478,205, Cl. 126-25.00R.

Moesner, Kurt: *See*—
Rones, Josef; Moller, Siegfried; and Moesner, Kurt, 4,478,647, Cl. 134-13.000.

Moghe, Sanjay B.; Gray, Roger E.; and Tsai, Wei, to Raytheon Company. Impedance matching network comprising selectable capacitance pads and selectable inductance strips or pads. 4,479,100, Cl. 333-33.000.

Mohler, Galen E.; and Peterson, Royal D. Combined laser resonator structure. 4,479,225, Cl. 372-97.000.

Mohn, Ulrich: *See*—
Bloss, Wolfgang; and Mohn, Ulrich, 4,478,810, Cl. 423-555.000.

Molin, Marc: *See*—
Gros, Georges; and Molin, Marc, 4,479,006, Cl. 548-312.000.

Molinatto, Bruno, to Componenti Grafici S.r.l. Pressure rollers with longitudinal axis of variable shape. 4,477,954, Cl. 29-116.0AD.

Moller, Siegfried: *See*—
Rones, Josef; Moller, Siegfried; and Moesner, Kurt, 4,478,647, Cl. 134-13.000.

Molloy, Lawrence. Elastic ankle and knee exerciser. 4,478,414, Cl. 272-134.000.

Momose, Hiroshi: *See*—
Nagakubo, Yoshihide; and Momose, Hiroshi, 4,478,655, Cl. 148-175.000.

Monarch Marking Systems, Inc.: *See*—
Mistyurik, John D., 4,478,145, Cl. 101-205.000.
Mistyurik, John D., 4,478,146, Cl. 101-205.000.
Pratt, John W., Jr., 4,478,484, Cl. 350-96.200.

Monier Resources, Inc.: *See*—
Raba, Carl F., Jr.; Smith, Robert L.; and Huang, Francis Y., 4,478,736, Cl. 252-180.000.

Monsanto Company: *See*—
McAlister, Donald R.; and Ziebold, Steven A., 4,478,809, Cl. 423-522.000.

Monsen, Dee N. Safe start system for automotive vehicles. 4,479,064, Cl. 290-37.00R.

Montalbano, Anthony J.: *See*—
Pricone, Robert M.; and Montalbano, Anthony J., 4,478,769, Cl. 264-1.600.

Montgomery, Edward C.: *See*—
Pierson, Robert M.; Haas, Edward J.; and Montgomery, Edward C., 4,478,266, Cl. 152-209.00R.

Montgomery, F. Dorsey; and Norin, Allan A., to Chef Automatique International Ltd. Preparation of a frozen food product for later use. 4,478,861, Cl. 426-295.000.

Moog Automotive, Inc.: *See*—
Levinson, Dale A.; and Ketterer, Leonard R., 4,478,531, Cl. 403-77.000.

Moore, James W.; and Wanie, Lee J., to Deere & Company. Mower blade spindle assembly. 4,478,029, Cl. 56-17.500.

Moore, Kenneth L.: *See*—
Black, William L.; and Moore, Kenneth L., 4,478,128, Cl. 89-7.000.

Moore, Paul A.: *See*—
Hjelsand, Timothy A.; and Moore, Paul A., 4,478,423, Cl. 277-59.000.

Moore, Richard P., to Blue Circle Projects (Proprietary) Limited. Particulate filter backwash outlet. 4,478,726, Cl. 210-793.000.

Moore, William F.: *See*—
Holden, Homer N.; Kleykamp, Donald L.; Moore, William F.; and Mathieu, Julien C., 4,478,154, Cl. 105-225.000.

Moraw, Roland; and Schaedlich, Renate, to Hoechst Aktiengesellschaft. Process for transferring a pigment image using a spacer. 4,478,924, Cl. 430-126.000.

Morf, Max: *See*—
Meyer, Hans R.; and Morf, Max, 4,478,598, Cl. 8-648.000.

Mori, Toshihiro, to Nippon Electric Co., Ltd. Radio paging receiver capable of muting battery saving function. 4,479,125, Cl. 340-825.440.

Morikawa, Toshio: *See*—
Ii, Akira; Morikawa, Toshio; and Suwahara, Hirosi, 4,478,764, Cl. 261-50.00A.

Morimoto, Yoshiro: *See*—
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,478,105, Cl. 74-730.000.

Morin, George A.; and Richardson, Raymond H. Inserting system for newspapers. 4,478,399, Cl. 270-55.000.

Morio, Yasumasa, to Kabushiki Kaisha Sakurakurepasu. Writing implement with automatic lead projection. 4,478,529, Cl. 401-53.000.

Moritoki, Masato; Fujikawa, Takao; and Miyanaga, Junichi, to Kabushiki Kaisha Kobe Seiko Sho. Method of hot isostatic pressing treatment. 4,478,626, Cl. 65-18.100.

Morre, Michel: *See*—
Mouzin, Gilbert; Cousse, Henri; Bonnaud, Bernard; Morre, Michel; and Stenger, Antoine, 4,478,836, Cl. 424-248.540.

Morris, Christopher L.; Idzorek, George C.; and Atencio, Leroy G., to United States of America, Energy. Imaging radiation detector with gain. 4,479,059, Cl. 250-385.000.

Morris, Frank E.: *See*—
Dudro, Harry R., Jr.; and Morris, Frank E., 4,478,395, Cl. 266-196.000.

Morrison Motor Corporation: *See*—
Morrison, Ronald D., 4,478,179, Cl. 123-44.00B.

Morrison, Ronald D., to Morrison Motor Corporation. Radial piston engines. 4,478,179, Cl. 123-44.00B.

Mortenson, C. Walter. Packed column distillation apparatus. 4,478,685, Cl. 202-158.000.

Moss, Herbert H.: *See*—
Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; and Wada, William T., 4,478,586, Cl. 441-4.000.

Mostek Corporation: *See*—
Larson, David N.; Ireland, Jeffrey; and Terry, Michael B., 4,479,097, Cl. 331-111.000.

Motion Control, Inc.: *See*—
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., 4,477,971, Cl. 29-877.000.

Motor Magnetics: *See*—
Bailey, J. Milton; Alexeff, Igor; and Kreidl, Werner H., 4,479,103, Cl. 335-229.000.

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Alexander, Robert P.; Pichia, Robert J.; and Dauksch, Stephen F., 4,477,970, Cl. 29-837.000.
Batlivala, Percy P.; and Kommrusch, Richard S., 4,479,245, Cl. 455-18.000.
Bjornholt, John E., 4,479,227, Cl. 375-1.000.
Flood, Steven P., 4,479,250, Cl. 455-213.000.
Kuo, Clinton C. K., 4,479,203, Cl. 365-218.000.

Mott, Donna M.: *See*—
Halpern, Yuval; Mott, Donna M.; and Niswander, Ron H., 4,478,998, Cl. 544-195.000.

Moulton, Anthony D. Fastener feeder. 4,478,112, Cl. 81-57.370.

Mourant, Jacques: *See*—
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,249, Cl. 455-208.000.
Geesen, Michel; Mourant, Jacques; and Ludwig, Daniel P., 4,479,255, Cl. 455-246.000.

Mouzin, Gilbert; Cousse, Henri; Bonnaud, Bernard; Morre, Michel; and Stenger, Antoine, to Pierre Fabre S.A. 1-Aryl 2-aminomethyl cyclopropane carboxyamide (Z) derivatives and their use as useful drugs in the treatment of disturbances of the central nervous system. 4,478,836, Cl. 424-248.540.

MTS Systems Corporation: *See*—
Gram, Martin M., 4,478,086, Cl. 73-781.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Huther, Werner; and Rossmann, Axel, 4,478,790, Cl. 419-54.000.

Muchnik, Simon V.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Muhling, Gunter: *See*—
Hess, Peter; Muhling, Gunter; and Schust, Gerhard, 4,478,099, Cl. 74-11.000.
Muhlratzer, August: *See*—
Zeilinger, Hans; Muhlratzer, August; and Stemmler, Bruno, 4,478,648, Cl. 148-6.300.
Muir, Arthur M. Exercise device and control valve therefor. 4,478,412, Cl. 272-130.000.
Muller, Bernard L.: *See*—
Schulte-Elte, Karl H.; Snowden, Roger L.; and Muller, Bernard L., 4,479,011, Cl. 568-361.000.
Muller, Erich: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,478,833, Cl. 424-246.000.
Muller, Friedhelm; and Nickel, Horst, to Bayer Aktiengesellschaft. Forgery-proof paper. 4,478,681, Cl. 162-140.000.
Muller, Karl-Heinz: *See*—
Krude, Werner; and Muller, Karl-Heinz, 4,478,592, Cl. 464-173.000.
Muller, Peter; and Mustacchi, Henry, to Andrews Paper & Chemical Co., Inc. Zinc sulfonates and their use in diazotypy. 4,478,926, Cl. 430-178.000.
Muller, Rudi; and Pauly, Axel, to Bayerische Motoren Werke Aktiengesellschaft. Suspension system for vehicles. 4,478,431, Cl. 280-710.000.
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., to Ekoeg Industries, Inc. Gang reel mower. 4,478,026, Cl. 56-7.000.
Mullner, Hubert: *See*—
Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Mullner, Hubert, 4,478,828, Cl. 424-177.000.
Multiplex Company, Inc.: *See*—
Jenkins, William K., 4,478,357, Cl. 222-135.000.
Mumford, Eustace H., to Owens-Illinois, Inc. Glass feeder heat baffle. 4,478,631, Cl. 65-327.000.
Mundorf, Traute: *See*—
Lee, Do I.; and Mundorf, Traute, 4,478,974, Cl. 524-533.000.
Mundschenk, Glenn R., to General Electric Company. Removable integrally molded closure. 4,478,005, Cl. 49-388.000.
Muramatsu, Kikuo, to Mitsubishi Denki Kabushiki Kaisha. Floppy disk drive with local processor control. 4,479,154, Cl. 360-69.000.
Murata, Kenji: *See*—
Ueno, Mitsushi; Maoka, Tadanori; Murata, Kenji; and Shirogami, Tamotsu, 4,478,918, Cl. 429-38.000.
Murata, Kimitoshi: *See*—
Ueda, Masahiro; Noba, Masahiko; Hori, Osamu; Murata, Kimitoshi; and Nakao, Hatsuo, 4,479,063, Cl. 290-30.00R.
Murata, Mitsuhiro: *See*—
Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, 4,478,524, Cl. 368-204.000.
Murayama, Ken: *See*—
Tanaka, Masakazu; and Murayama, Ken, 4,478,961, Cl. 523-105.000.
Muscatell, Ralph P. Laser microphone. 4,479,265, Cl. 455-605.000.
Muschaweck, Roman: *See*—
Sturm, Karl; Muschaweck, Roman; and Hropot, Max, 4,478,843, Cl. 424-269.000.
Musha, Toru, to Olympus Optical Co., Ltd. Apparatus for driving objective lens in tracking direction. 4,479,051, Cl. 250-202.000.
Mustacchi, Henry: *See*—
Muller, Peter; and Mustacchi, Henry, 4,478,926, Cl. 430-178.000.
Musto, Richard L., to Combustion Engineering, Inc. Mill recirculation system. 4,478,157, Cl. 110-106.000.
Muth, Glenn D.: *See*—
Buschman, Bob D.; Muth, Glenn D.; and O'Connell, Ronald T., 4,479,142, Cl. 358-13.000.
Myles, Walter E.: *See*—
Sheck, Wah; Beasley, Daniel T.; and Myles, Walter E., 4,479,148, Cl. 358-290.000.
N.F.A. Corp.: *See*—
Graff, Paul, 4,477,928, Cl. 2-221.000.
Naaktgeboren, Adrianus: *See*—
De Coene, Frans J. G. C.; and Naaktgeboren, Adrianus, 4,478,027, Cl. 56-16.400.
Nadkarni, Anil V.; Samal, Prasanna K.; Wang, James C.; and Sunk, James E., to SCM Corporation. Method of making dispersion strengthened metal bodies and product. 4,478,787, Cl. 419-8.000.
Nagai, Koichi: *See*—
Oshima, Hiroyo; Kojima, Yutaka; Kobayashi, Yukio; Omori, Takashi; and Nagai, Koichi, 4,478,910, Cl. 428-331.000.
Nagakubo, Yoshihide; and Momose, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor device. 4,478,655, Cl. 148-175.000.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Transistor circuit. 4,479,086, Cl. 323-315.000.
Nagano, Youichi: *See*—
Takai, Toru; Takei, Kenji; and Nagano, Youichi, 4,478,463, Cl. 384-482.000.
Naganoma, Masanori; Kato, Yoshiharu; Saito, Atsunori; Hara, Yoshimichi; and Matsushima, Katsuaki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. System for controlling a vehicle-mounted air conditioner. 4,478,274, Cl. 165-12.000.
Nagashima, Akira; and Kondo, Tadashige, to Kioritz Corporation. Electronic ignition system for internal combustion engine capable of supplying electric power to auxiliary unit. 4,478,200, Cl. 123-605.000.
Nagashima, Akira. Fuel tank lid. 4,478,239, Cl. 137-209.000.
Nagata, Wataru: *See*—
Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,478,997, Cl. 544-71.000.
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; and Sato, Kozo, to Fuji Photo Film Co., Ltd. Heat-developable color photographic materials. 4,478,927, Cl. 430-203.000.
Nakagawa, Kenichi; Minezaki, Shigehiro; and Funada, Fumiaki, to Sharp Kabushiki Kaisha. 4-Alkylcyclohexyl 4-alkanoyloxybenzoate and liquid crystal composition thereof. 4,478,741, Cl. 252-299.630.
Nakagiri, Takashi: *See*—
Yoshioka, Seishiro; Hirai, Yutaka; Fukuda, Tadaji; Fukaya, Masaki; and Nakagiri, Takashi, 4,479,149, Cl. 358-294.000.
Nakahara, Kiyoharu: *See*—
Hasegawa, Tsuneo; Nakahara, Kiyoharu; and Hasegawa, Seitaro, 4,478,716, Cl. 210-289.000.
Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Aperture control device for use in a still camera. 4,478,502, Cl. 354-416.000.
Nakajima, Isao: *See*—
Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, 4,478,995, Cl. 536-46.000.
Nakajima, Takeshi: *See*—
Oda, Takashi; and Nakajima, Takeshi, 4,479,261, Cl. 455-343.000.
Nakamura, Akito: *See*—
Makami, Ryuzo; and Nakamura, Akito, 4,478,895, Cl. 427-407.300.
Nakamura, Genshiro: *See*—
Sato, Kazuhiko; Nakamura, Genshiro; and Yukimoto, Yoshinori, 4,479,028, Cl. 136-249.000.
Nakamura, Masayoshi: *See*—
Yazaki, Mitsuyoshi; Tanaka, Hideo; and Nakamura, Masayoshi, 4,478,735, Cl. 252-135.000.
Nakamura, Toshiaki: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,478,550, Cl. 415-53.00T.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, to Toyota Jidosha Kabushiki Kaisha. Helically-shaped intake port of an internal combustion engine. 4,478,182, Cl. 123-188.00M.
Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for maintaining a constant vehicle speed. 4,479,184, Cl. 364-424.000.
Nakao, Hatsuo: *See*—
Ueda, Masahiro; Noba, Masahiko; Hori, Osamu; Murata, Kimitoshi; and Nakao, Hatsuo, 4,479,063, Cl. 290-30.00R.
Nakao, Sho: *See*—
Shiba, Keisuke; Nakao, Sho; and Koizumi, Shigeo, 4,478,930, Cl. 430-271.000.
Nakayama, Mituhisa, to U.S. Philips Corporation. Record-disc player. 4,479,210, Cl. 369-194.000.
Nakayama, Takehisa: *See*—
Harigai, Akinori; Aoki, Shinichi; and Nakayama, Takehisa, 4,477,999, Cl. 446-470.000.
Nakazawa, Kichi: *See*—
Akisue, Osamu; Hatae, Seiryo; Toki, Hiroaki; Nakazawa, Kichi; and Wakako, Atsuhiro, 4,478,649, Cl. 148-12.00C.
Nalco Chemical Company: *See*—
Payne, Charles C., 4,478,742, Cl. 252-313.00S.
Namiki, Junji, to Nippon Electric Co., Ltd. Cross-polarization crosstalk canceller. 4,479,258, Cl. 455-295.000.
Napierski, Reinhard, to Statomat-Globe Maschinenfabrik GmbH. Method of and apparatus for winding and inserting coils in slots of stator or rotor lamination assemblies of electrical machines. 4,477,966, Cl. 29-596.000.
Napp, Tracy E.: *See*—
Bupp, James R.; Markovich, Voya; Napp, Tracy E.; and Sambucetti, Carlos J., 4,478,883, Cl. 427-97.000.
Nara, Seietsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Classifying apparatus with automatic removal device. 4,479,187, Cl. 364-478.000.
Narasaka, Shin; Otsuka, Kazuo; and Kishida, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling exhaust-gas recirculation in internal combustion engine. 4,478,199, Cl. 123-571.000.
Narr, Berthold: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,478,833, Cl. 424-246.000.
Nasu, Koji: *See*—
Tanaka, Michio; Kamatani, Yoshio; and Nasu, Koji, 4,478,894, Cl. 427-388.200.
National Research Development Corporation: *See*—
Price, Clifford A., 4,478,911, Cl. 428-332.000.
Sanderson, Arnold R., 4,478,823, Cl. 424-88.000.
National Steel Corporation: *See*—
Amberson, Paul E., 4,478,892, Cl. 427-320.000.
Natzke, Ronald C.; and Klee, Maurice, to J. I. Case Company. Control handle lockup. 4,478,307, Cl. 180-273.000.
Nautilus Sports/Medical Industries, Inc.: *See*—
Baldwin, Dan D., 4,478,411, Cl. 272-118.000.
Navarro, Carlos R.; and Mallen Fuentes, Jose M., to Concast Service Union AG. Guide apparatus for a rigid starting bar. 4,478,271, Cl. 164-426.000.
Nazif, Zaher A.: *See*—
Ferrer, Richard S.; Goldstein, Alan J.; and Nazif, Zaher A., 4,479,196, Cl. 364-900.000.

Nebe, Juergen; and Ladeur, Bernhard H., to Standard Oil Company (Indiana). Woven fabric containing partially fibrillated textile yarn. 4,478,900, Cl. 428-92.000.
NEC Corporation: *See—*
Oda, Takashi; and Nakajima, Takeshi, 4,479,261, Cl. 455-343.000.
Neely, James E., Jr.; and Jacobson, Annette M., to PPG Industries, Inc. Spandrel product with silicate coating. 4,478,905, Cl. 428-324.000.
Nelson, John W.: *See—*
Adair, Peter J.; Hobczuk, Michael P.; Kingsbury, Paul I.; and Nelson, John W., 4,478,641, Cl. 106-110.000.
Nermes, Esko O.: *See—*
Aaltonen, Olavi A.; Malmstrom, Rolf E.; Nermes, Esko O.; and Tuominen, Tapio K., 4,478,394, Cl. 266-162.000.
Netherwood, Shelley: *See—*
Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., 4,478,864, Cl. 426-534.000.
Neuwald, Anselm, to Siemens Aktiengesellschaft. Method for the preparation of metal-free strips in the metal vapor deposition of an insulating tape. 4,478,878, Cl. 427-79.000.
Neuzeret, Bernard; Richard, Jean; and Comeau, Jean-Francois, to Socla, S.A. Disconnector for hydraulic circuits. 4,478,236, Cl. 137-107.000.
NF Circuit Design Block Co., Ltd.: *See—*
Kakino, Yoshiaki, 4,478,538, Cl. 408-6.000.
NGK Insulators, Ltd.: *See—*
Horikita, Hiroyuki; and Kataoka, Tetsuo, 4,478,766, Cl. 261-124.000.
Nickel, Horst: *See—*
Muller, Friedhelm; and Nickel, Horst, 4,478,681, Cl. 162-140.000.
Nickl, Josef: *See—*
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,478,833, Cl. 424-246.000.
Nickles, Richmond H.: *See—*
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Nicolai, Franz: *See—*
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Nicolet, Marc: *See—*
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Niederer, Lee H.: *See—*
Niederer, Thomas O.; and Niederer, Lee H., 4,478,302, Cl. 177-145.000.
Niederer, Thomas O.; and Niederer, Lee H., to Otto Niederer Sons, Inc. Egg weighing means. 4,478,302, Cl. 177-145.000.
Nifco Inc.: *See—*
Mizusawa, Akira; and Notoya, Yoshiaki, 4,478,545, Cl. 411-57.000.
Nihon Keiki Co., Ltd.: *See—*
Yasuda, Mieji, 4,478,232, Cl. 132-73.600.
Niimi, Yukihide: *See—*
Kinoshita, Kenzi; Niimi, Yukihide; and Urushidani, Masahiro, 4,478,191, Cl. 123-489.000.
Kinoshita, Kenzi; Niimi, Yukihide; Urushidani, Masahiro; and Ohnaka, Hidemi, 4,478,192, Cl. 123-489.000.
Nilsson, Jan, to ASEA AB. Method of manufacturing an object of metallic or ceramic material. 4,478,789, Cl. 419-49.000.
Nippan Soken, Inc.: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,479,068, Cl. 310-194.000.
Nippon Electric Co., Ltd.: *See—*
Atobe, Masaaki, 4,479,099, Cl. 332-10.000.
Mori, Toshihiro, 4,479,125, Cl. 340-825.440.
Namiki, Junji, 4,479,258, Cl. 455-295.000.
Sakoe, Hiroaki, 4,479,236, Cl. 381-43.000.
Nippon Kogaku K.K.: *See—*
Azuma, Toru; Hazama, Junji; Kawahara, Atsushi; Hada, Kazunari; and Fujii, Norio, 4,479,145, Cl. 358-106.000.
Nippon Paint Co., Ltd.: *See—*
Kuwahara, Tosihide; Kiboku, Mituo; Ito, Seisiro; Ihara, Tatuhiko; and Ikeda, Shoji, 4,478,643, Cl. 106-288.00Q.
Nippon Seiko Kabushiki Kaisha: *See—*
Takai, Toru; Takei, Kenji; and Nagano, Youichi, 4,478,463, Cl. 384-482.000.
Nippon Soken, Inc.: *See—*
Kikuchi, Tetsuro; Kato, Masanori; Kato, Masahiko; Kato, Kazutaka; and Kumoi, Tomio, 4,478,181, Cl. 123-145.00A.
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.
Ohta, Minoru; Yasuda, Eturo; Kawakami, Tomio; and Kotanshi, Yoichi, 4,478,067, Cl. 73-23.000.
Shinoda, Yoshio; and Kuno, Akira, 4,478,184, Cl. 123-352.000.
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, 4,478,433, Cl. 280-807.000.
Nippon Steel Corporation: *See—*
Akisue, Osamu; Hatae, Seiryo; Toki, Hiroaki; Nakazawa, Kichi; and Wakako, Atsuhiro, 4,478,649, Cl. 148-12.00C.
Nippon Tungsten Co., Ltd.: *See—*
Sakaguchi, Shigeya; Shiroyama, Masaharu; and Ito, Hiroshi, 4,478,871, Cl. 427-34.000.
Nippondenso Co., Ltd.: *See—*
Fukui, Tomonori; and Eguchi, Osamu, 4,478,049, Cl. 62-179.000.
Hayakawa, Hideyuki; Matsui, Kazuma; Hattori, Yoshiyuki; and Kinbara, Hiroji, 4,478,595, Cl. 474-109.000.
Kikuchi, Tetsuro; Kato, Masanori; Kato, Masahiko; Kato, Kazutaka; and Kumoi, Tomio, 4,478,181, Cl. 123-145.00A.
Kinoshita, Kenzi; Niimi, Yukihide; and Urushidani, Masahiro, 4,478,191, Cl. 123-489.000.
Kinoshita, Kenzi; Niimi, Yukihide; Urushidani, Masahiro; and Ohnaka, Hidemi, 4,478,192, Cl. 123-489.000.
Naganoma, Masanori; Kato, Yoshiharu; Saito, Atsunori; Hara, Yoshimichi; and Matsushima, Katsuaki, 4,478,274, Cl. 165-12.000.
Takai, Hiromitsu; and Shibata, Akira, 4,479,190, Cl. 364-556.000.
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,478,550, Cl. 415-53.00T.
Yabuoshi, Susumu; Uzura, Shogo; and Hayashi, Nobuyuki, 4,477,967, Cl. 29-596.000.
Nishikawa, Satoshi: *See—*
Kohno, Kiyoshi; Nishikawa, Satoshi; Hattori, Yoshiya; and Kitao, Kohji, 4,478,990, Cl. 526-279.000.
Nishikawa, Yasuhisa; Tanaka, Yoshio; Hasumi, Ryoichi; and Koizumi, Takashi, to Clarion Co., Ltd. Pushbutton tuner. 4,478,098, Cl. 74-10.330.
Nishimura, Sadanori; and Maezono, Masakazu, to Honda Giken Kogyo Kabushiki Kaisha. Control apparatus for oil pressure operated type transmission for vehicle. 4,478,108, Cl. 74-866.000.
Nishimura, Sanji: *See—*
Watanabe, Morio; and Nishimura, Sanji, 4,478,804, Cl. 423-259.000.
Nishimura, Yutaka: *See—*
Oyama, Yoshishige; Kuroiwa, Hiroshi; and Nishimura, Yutaka, 4,478,075, Cl. 73-118.200.
Nissan Motor Company: *See—*
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Nissan Motor Company, Limited: *See—*
Kawaura, Takayoshi, 4,478,396, Cl. 267-8.00R.
Kobayashi, Hiroshi, 4,479,116, Cl. 340-620.000.
Matsuoka, Hideoki; and Yamamoto, Yoshimi, 4,478,432, Cl. 280-804.000.
Sugasawa, Fukashi, 4,479,237, Cl. 381-57.000.
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,478,105, Cl. 74-730.000.
Nissen, Axel: *See—*
Klahr, Erhard; Rebafka, Walter; Nissen, Axel; Trieselt, Wolfgang; and Hettche, Albert, 4,479,016, Cl. 568-606.000.
Nisshin Steel Co., Ltd.: *See—*
Fuzii, Koichiro, 4,478,392, Cl. 266-44.000.
Niswander, Ron H.: *See—*
Halpern, Yuval; Mott, Donna M.; and Niswander, Ron H., 4,478,998, Cl. 544-195.000.
Niwa, Haruho: *See—*
Kitayama, Hideo; and Niwa, Haruho, 4,478,573, Cl. 432-124.000.
Noba, Masahiko: *See—*
Ueda, Masahiro; Noba, Masahiko; Hori, Osamu; Murata, Kimitoshi; and Nakao, Hatsuo, 4,479,063, Cl. 290-30.00R.
Nobel, Fred I., to LeaRonal, Inc. Electrodeposition of palladium-silver alloys. 4,478,692, Cl. 204-43.00R.
Nojima, Minejiro; Kobayashi, Makiji; and Kobayashi, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Integrated circuit with interruptable oscillator circuit. 4,479,191, Cl. 364-707.000.
Nolte, Gerhard: *See—*
Hendrischk, Wolfgang; and Nolte, Gerhard, 4,478,143, Cl. 101-93.050.
Nolte, Kenneth G.; and Smith, Michael B., to Standard Oil Company, The. Height control technique in hydraulic fracturing treatments. 4,478,282, Cl. 166-281.000.
Nomota, Reishi: *See—*
Hanyu, Susumu; Kasuga, Noboru; Nomota, Reishi; and Ebata, Yoshikazu, 4,478,161, Cl. 112-155.000.
Nomura, Masami, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for operating an AC power elevator. 4,478,315, Cl. 187-29.00R.
Nomura, Yutaka: *See—*
Ayusawa, Tadashi; Aoki, Tadamichi; and Nomura, Yutaka, 4,479,017, Cl. 568-613.000.
Norda Tubazioni S.P.A.: *See—*
Ziliani, Franco, 4,478,428, Cl. 280-651.000.
Nordson Corporation: *See—*
Hastings, Donald R., 4,478,370, Cl. 239-707.000.
Norin, Allan A.: *See—*
Montgomery, F. Dorsey; and Norin, Allan A., 4,478,861, Cl. 426-295.000.
North American Philips Consumer Electronics Corp.: *See—*
Rychlewski, Thaddeus V., 4,478,590, Cl. 445-50.000.
North American Philips Lighting Corp.: *See—*
Bhalla, Ranbir S., 4,479,074, Cl. 313-628.000.
Norton Co.: *See—*
Russell, Richard H., 4,478,011, Cl. 51-360.000.
Norton, Robert O.: *See—*
DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., 4,478,050, Cl. 62-193.000.
Notheis, Patrick J., to Kimberly-Clark Corporation. Meltblown microfiber wiper package, dispensing system therefor. 4,478,354, Cl. 221-34.000.
Notoya, Yoshiaki: *See—*
Mizusawa, Akira; and Notoya, Yoshiaki, 4,478,545, Cl. 411-57.000.

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Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,854, Cl. 426-12.000.
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Hoppie, Lyle O.; McNinch, Joseph H., Jr.; and Nowell, Gregory C., 4,478,777, Cl. 264-102.000.

Nuc-Med, Inc.: *See*—
Burchiel, Scott W.; Rhodes, Buck A.; and Crockford, David R., 4,478,815, Cl. 424-1.100.

Numata, Norio: *See*—
Yokoya, Satoshi; and Numata, Norio, 4,479,234, Cl. 381-15.000.

Nung, Vien N.: *See*—
Hercelin, Bernard; Mary, Irene; and Nung, Vien N., 4,478,819, Cl. 424-37.000.

Nussbaumer, Henri: *See*—
Galand, Claude; and Nussbaumer, Henri, 4,479,213, Cl. 370-118.000.

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Benneche, Tore; Gacek, Mikkel; and Undheim, Kjell, 4,478,839, Cl. 424-251.000.

Nylund, Olov: *See*—
Andersson, Ingmar; Borrman, Bo; Fredin, Bo; and Nylund, Olov, 4,478,786, Cl. 376-444.000.

Nyman, Swen: *See*—
Burnecke, Manfred; and Nyman, Swen, 4,477,959, Cl. 29-433.000.

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Denley, Ronald S.; and Van Zeeland, Anthony J., 4,479,040, Cl. 200-77.000.

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Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio and ignition timing regulation by detecting engine running condition. 4,478,185, Cl. 123-419.000.

Obeissart, Albert, to Souriau & Cie (SA). Optical fiber connectors. 4,478,487, Cl. 350-96.210.

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Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Mullner, Hubert, 4,478,828, Cl. 424-177.000.

Oce-Nederland B.V.: *See*—
Eertink, Bastiaan B. B.; and Leppink, Arie, 4,478,405, Cl. 271-227.000.

O'Connell, Ronald T.: *See*—
Buschman, Bob D.; Muth, Glenn D.; and O'Connell, Ronald T., 4,479,142, Cl. 358-13.000.

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Offutt, Warren B.; and Hastings, Jerome K., to Eaton Corporation. High speed reciprocal electromagnetic actuator with cancelled retarding-flux. 4,479,162, Cl. 361-210.000.

Ogawa, Nobuo: *See*—
Itho, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; and Yamagishi, Kagari, 4,478,838, Cl. 424-250.000.

Ogawa, Yasuhiro; and Fukui, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Secondary arc extinction device. 4,479,084, Cl. 323-210.000.

Ogden, Ralph. Membrane switch control panel arrangement and label assembly for labeling same. 4,478,666, Cl. 156-240.000.

Ogino, Keizo; Takehara, Masahiro; Miyoshi, Takeshi; and Sagawa, Koichiro, to Ajinomoto Company Incorporated. Detergent composition comprising a mixture of an N-acyllysine and anionic surface active agents, possessing unique properties in soft and hard water. 4,478,734, Cl. 252-117.000.

Ohata, Yousuke: *See*—
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Ohba, Toshihiro; Kawaguchi, Masashi; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Method and apparatus for driving a thin-film EL panel. 4,479,120, Cl. 340-781.000.

Ohlson, Johnny: *See*—
Holmlund, Dan; and Ohlson, Johnny, 4,478,126, Cl. 86-1.00B.

Ohlsson, Johnny, to Aktiebolaget Bofors. Spherical container or chamber. 4,478,350, Cl. 220-436.000.

Ohnaka, Hidemi: *See*—
Kinoshita, Kenzi; Niimi, Yukihide; Urushidani, Masahiro; and Ohnaka, Hidemi, 4,478,192, Cl. 123-489.000.

Ohnishi, Masahiro: *See*—
Shiozawa, Etuo; Ohnishi, Masahiro; and Harada, Shigeo, 4,479,133, Cl. 346-108.000.

Ohnishi, Shunsaku: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,478,550, Cl. 415-53.00T.

Ohniwa, Kohichi, to Mitsubishi Denki Kabushiki Kaisha. Pattern sewing machine. 4,478,160, Cl. 112-121.120.

Ohno, Kaisaku. Foldable binocular assembly. 4,478,498, Cl. 350-546.000.

Ohta, Minoru; Yasuda, Eturo; Kawakami, Tomio; and Kotanshi, Yoichi, to Nippon Soken, Inc. Gas composition sensor. 4,478,067, Cl. 73-23.000.

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Ohyama, Satoshi: *See*—
Kamata, Isao; and Ohyama, Satoshi, 4,479,165, Cl. 361-335.000.

Okada, Hitoshi: *See*—
Takai, Kazuki; Okada, Hitoshi; and Yamaguchi, Katsumi, 4,479,155, Cl. 360-96.500.

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Okamoto, Yoshio: *See*—
Yuki, Heimei; and Okamoto, Yoshio, 4,478,953, Cl. 502-155.000.

Okumura, Takeshi: *See*—
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Okuno, Ryuzo; Toyoda, Keio; Sarai, Masahiro; and Takai, Kiyoshi, to Kawasaki Jukogyo Kabushiki Kaisha; and Godo Seitettu Kabushiki Kaisha. Scrap preheating system for an electric furnace. 4,478,574, Cl. 432-180.000.

Olin Corporation: *See*—
Brenneman, William L., 4,478,064, Cl. 72-232.000.
Bridges, William G.; and Foster, Craig A., 4,478,170, Cl. 118-64.000.
Bridges, William G.; and Foster, Craig A., 4,478,171, Cl. 118-64.000.
Brock, Andrew J.; and Mandigo, Frank N., 4,478,651, Cl. 148-31.500.
Dorman, Earl C., 4,478,314, Cl. 187-9.00R.

Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, to SKF Kugellagerfabriken GmbH. Method of making a thin-walled bearing bushing. 4,478,066, Cl. 72-358.000.

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Olshansky, Robert, to Corning Glass Works. Method of making optimal index profile for multicomponent nonlinear glass optical waveguide. 4,478,623, Cl. 65-3.120.

Olson, Glenn O.: *See*—
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Olson, Billy E., to AMP Incorporated. Zero insertion force connector having improved cams. 4,478,471, Cl. 339-74.00R.

Olympus Optical Co., Ltd.: *See*—
Mihara, Shinichi, 4,478,497, Cl. 350-476.000.
Musha, Toru, 4,479,051, Cl. 250-202.000.

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Zobel, Frederick A.; Burke, Joseph D.; and Oppy, John T., 4,478,867, Cl. 426-570.000.

Oren, Jess W., III, to Armstrong World Industries, Inc. Textile roll-weight gauge. 4,478,092, Cl. 73-862.550.

Oren, William H. Gun sight. 4,477,979, Cl. 33-257.000.

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Kamei, Kazuo; and Orimoto, Akira, 4,479,159, Cl. 360-137.000.

Orndorff, Steve A., to Westvaco Corporation. Enzymatic catalyzed biocide system. 4,478,683, Cl. 162-161.000.

Orthwein, William G. Anti-buckling device for mine-roof bolting machines. 4,478,290, Cl. 173-11.000.

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Tullin, Flemming, 4,478,475, Cl. 339-97.00R.

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Vedvik, Andrew H.; and Merdler, Myron J., 4,478,024, Cl. 53-473.000.

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Banov, Mikhail D.; Oshkin, Anatoly I.; and Chernyshev, Alexandr N., 4,479,029, Cl. 174-15.0WF.

Ostrowsky, Efrem M., to Ethyl Molded Products Company. Tamper-indicating closure. 4,478,343, Cl. 215-252.000.

O'Sullivan, Eileen F., to American Can Company. Plastic sheet having high gloss and low coefficient of friction and method for producing the same. 4,478,663, Cl. 156-203.000.

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Narasaka, Shin; Otsuka, Kazuo; and Kishida, Eiji, 4,478,199, Cl. 123-571.000.

Ott, Clifford J. Method for manufacture of ammonium thiosulfate from ammonia and solid sulfur or H_2S rich gas stream and/or both solid sulfur and H_2S gas streams. 4,478,807, Cl. 423-514.000.

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Niederer, Thomas O.; and Niederer, Lee H., 4,478,302, Cl. 177-145.000.

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Wolf, Elmar, 4,478,031, Cl. 56-202.000.

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Honkaniemi, Matti E.; Juntunen, Veikko A.; Keinanen, Veli J.; and Mansikka, Urpo J., 4,478,802, Cl. 423-236.000.

Owen, Douglas B., to D. W. Zimmerman Mfg., Inc. Downhole pump with check valve. 4,478,558, Cl. 417-296.000.

Owens-Corning Fiberglas Corporation: *See—*
Brady, Thomas R.; and Benner, Lester C., 4,478,869, Cl. 427-10.000.
Dunn, Charles S., 4,478,628, Cl. 65-29.000.
Grubka, Lawrence J., 4,478,625, Cl. 65-11.100.
Hohman, Charles M.; Propster, Mark A.; Dunn, Charles; and Seng, Stephen, 4,478,627, Cl. 65-27.000.
Uffner, William E.; White, Robert N.; and Harrington, Edward R., 4,478,912, Cl. 428-349.000.

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Kishida, Kozi; Iwato, Noboru; and Ozeki, Yuji, 4,478,903, Cl. 428-216.000.

Pachonik, Horst; and Seebacher, Gerhard, to Siemens Aktiengesellschaft. Method for the preparation of regenerable dielectric layers through polymerization of gases. 4,478,875, Cl. 427-41.000.

Page, Ronald C.; and Smith, Derek J., to Massey-Ferguson Services N.V. Lever mechanism. 4,478,104, Cl. 74-479.000.

Page, William R.: *See—*
Rees, James G., 4,478,617, Cl. 55-314.000.

Palmberg, Roger: *See—*
Hasse, Jaroslav; and Palmberg, Roger, 4,478,724, Cl. 210-679.000.

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Palmer, Keith W.: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,478,806, Cl. 423-328.000.

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Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; and Wada, William T., 4,478,586, Cl. 441-4.000.

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Aviles, Henry E.; Gregory, Jane A.; Panissidi, Hugo A.; and Wattenbarger, Henry E., 4,478,089, Cl. 73-862.040.

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Spong, Gary W., 4,478,346, Cl. 220-90.200.

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Parham, B. J.: *See—*
Puntar, Joseph; and Parham, B. J., 4,478,279, Cl. 166-121.000.

Parker Chemical Company: *See—*
Rones, Josef; Moller, Siegfried; and Moesner, Kurt, 4,478,647, Cl. 134-13.000.

Parker, Dane K., to Goodyear Tire & Rubber Company, The. Polymer bound aryl substituted crown ethers. 4,478,983, Cl. 525-332.200.

Parnell, James A., to Bausch & Lomb Incorporated. Digitizing cursor and coordinate grid system. 4,479,032, Cl. 178-19.000.

Parrish, William J., to Santa Barbara Research Center. Charge coupled device open circuit image detector. 4,479,139, Cl. 357-24.000.

Pasko, Walter J.: *See—*
Ettinger, Robert H.; and Pasko, Walter J., 4,479,104, Cl. 336-219.000.

Patel, Bhupendra P.: *See—*
Prusak, John J.; and Patel, Bhupendra P., 4,478,566, Cl. 425-149.000.

Patent Truehand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Gaugel, Manfred; and Schonherr, Walter, 4,479,072, Cl. 313-113.000.

Paterson, Malcolm M.; and Plowell, Dennis H., to Raytheon Company. Bypass feed apparatus. 4,478,372, Cl. 241-35.000.

Patkos, Stephen. Press Feeder. 4,478,360, Cl. 225-163.000.

Paul Flum Ideas, Inc.: *See—*
Flum, Paul, 4,478,337, Cl. 211-49.00D.

Pauly, Axel: *See—*
Muller, Rudi; and Pauly, Axel, 4,478,431, Cl. 280-710.000.

Pauze, Denis R., to General Electric Company. Blended polyesterimide-polyesteramideimide electrical coating compositions. 4,478,913, Cl. 428-383.000.

Payne, Charles C., to Nalco Chemical Company. Preparation of a ferric acetate coated silica sol by selective anion exchange. 4,478,742, Cl. 252-313.00S.

Payne, Frank, to Robert Shaw Controls Company. Electrical switch construction and method of making the same. 4,479,039, Cl. 200-67.00D.

Pearson, William S., to Cyrpo, Incorporated. Back pressure compensator for apparatus for controlling liquid level in a reservoir. 4,478,555, Cl. 417-7.000.

Pease, Charles C.: *See—*
Wilkinson, Harold C.; Pease, Charles C.; and Wall, Kevin, 4,478,022, Cl. 52-509.000.

Pedlick, John S.: *See—*
Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, 4,478,220, Cl. 128-326.000.

Peloza, Kirk B., to Eaton Corporation. Water valve with heat transfer socket. 4,478,365, Cl. 236-38.000.

Perfection Electronic Products Corp.: *See—*
Evans, Dennis W.; and Ellis, John F., 4,478,521, Cl. 368-8.000.

Perhach, John M.: *See—*
Clifford, Earl W.; Perhach, John M.; and Sorce, Peter S., 4,478,070, Cl. 73-49.300.

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Loveland, Robert S., 4,478,088, Cl. 73-861.280.

Perkins, Roger J.: *See—*
Smith, Murray S., Jr.; Perkins, Roger J.; Fryxell, Robert E.; and Young, William R., 4,478,638, Cl. 75-255.000.

Perlstein, Jerome H.; and Haley, Neil F., to Eastman Kodak Company. Electrically conductive compositions. 4,478,922, Cl. 430-58.000.

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Perrut, Michel, to Societe Nationale Elf Aquitaine. Fractionation process for mixtures by elution chromatography with liquid in supercritical state and installation for its operation. 4,478,720, Cl. 210-659.000.

Person, Gary J. Construction material, a modular, pre-insulated and furred structural masonry building block. 4,478,021, Cl. 52-375.000.

Perten, Peter. Infrared analyzer, especially for foodstuffs such as flour. 4,479,055, Cl. 250-338.000.

Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company, The. Upgrading synthesis gas. 4,478,955, Cl. 518-713.000.

Peters, Reinhard: *See—*
Buethe, Ingolf; Marx, Matthias; Schleier, Gisbert; and Peters, Reinhard, 4,478,960, Cl. 521-160.000.

Peterson, Ann E.: *See—*
Gallusser, David O.; and Peterson, Ann E., 4,478,474, Cl. 339-89.00M.

Peterson, Carl R.: *See—*
Applebaum, Albert; Will, Albert S.; Humphrey, Samuel A.; McLean, Frank C.; Wolf, Sylvan; Peterson, Carl R.; Gauzza, Harry J.; and Hetzler, John C., 4,478,148, Cl. 102-390.000.

Peterson, Royal D.: *See—*
Mohler, Galen E.; and Peterson, Royal D., 4,479,225, Cl. 372-97.000.

Petit-Laurent, Hector: *See—*
Wilkomirsky, Igor; Reghezza, Andres; and Petit-Laurent, Hector, 4,478,698, Cl. 204-106.000.

Petrarch Systems Inc.: *See—*
Arkles, Barry C., 4,478,981, Cl. 525-92.000.

Petroleum Concepts, Inc.: *See—*
Hake, Lewis W.; Huff, Charles F.; and Miller, J. Wayne, 4,478,298, Cl. 175-329.000.

Petursson, Sigurdur G., to Waltec Inc. Shower pulsator. 4,478,367, Cl. 239-381.000.

Pfaff Haushaltmaschinen GmbH: *See—*
Kemmel, Patrice J.; and Hartwig, Jurgen, 4,479,077, Cl. 318-245.000.

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Barth, Wayne E., 4,478,748, Cl. 260-245.20R.

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Audiau, Francois; and Le Fur, Gerard R., 4,478,841, Cl. 424-263.000.
Girot, Pierre; and Boschetti, Egisto, 4,478,713, Cl. 210-101.000.

Philip Morris, Incorporated: *See—*
Houminer, Yoram; and Grubbs, Harvey J., 4,479,003, Cl. 546-341.000.

Philippbar, Jay E. Ceramic voice coil assembly. 4,479,035, Cl. 179-115.5VC.

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Phillips Petroleum Company: *See—*
Reed, Jerry O.; and Mathis, Ronald D., 4,478,969, Cl. 524-106.000.
Schuettenberg, Alexander D., 4,478,604, Cl. 44-63.000.
Shioyama, Tod K., 4,479,009, Cl. 564-447.000.
Van Pool, Joe, 4,479,018, Cl. 568-697.000.

Piccolo, Dominick J.: *See—*
Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., 4,478,864, Cl. 426-534.000.

Pichia, Robert J.: *See*—
Alexander, Robert P.; Pichia, Robert J.; and Dauksch, Stephen F., 4,477,970, Cl. 29-837.000.

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Brandt, Lennart; and Pichl, Heinz, 4,478,585, Cl. 440-112.000.

Picozza, Augusto A., to Dart Industries Inc. Carrier with handle for containers or the like. 4,478,450, Cl. 294-31.200.

Pierre Fabre S.A.: *See*—
Mouzin, Gilbert; Cousse, Henri; Bonnaud, Bernard; Morre, Michel; and Stenger, Antoine, 4,478,836, Cl. 424-248.540.

Pierson, Robert M.; Haas, Edward J.; and Montgomery, Edward C., to Goodyear Tire & Rubber Company, The. Composite tread having good traction and reduced rolling resistance upon wear. 4,478,266, Cl. 152-209.00R.

Pioneer Electronic Corporation: *See*—
Kamei, Kazuo; and Orimoto, Akira, 4,479,159, Cl. 360-137.000.

Piper, Francis R.: *See*—
Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., 4,477,986, Cl. 73-40.700.

Pissiotas, Georg: *See*—
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,478,635, Cl. 71-92.000.

Pitha, Jay R. Fireplace construction. 4,478,208, Cl. 126-121.000.

Pitney Bowes Inc.: *See*—
Erwin, Timothy R., 4,478,443, Cl. 292-307.00R.

Pittion, Philippe; Andre, Guy; Souillard, Gerald; J'espere, Jean-Louis; and Houte, Bernard, to Raymond, A. Pipe clamp. 4,478,381, Cl. 248-71.000.

Pittman, Edgar H., to Milliken Research Corporation. Method, apparatus and intermittently textured yarn. 4,478,036, Cl. 57-283.000.

Pittway Corporation: *See*—
Schoen, Erich W.; and Tice, Lee D., 4,478,468, Cl. 315-291.000.

Planer, Norman G.: *See*—
Gille, Robert A.; Planer, Norman G.; and Zansky, Zoltan, 4,479,175, Cl. 363-41.000.

Planmobel Eggersmann GmbH & Co. KG: *See*—
Votteler, Arno; Danuzzi, Max; Dubach, Fredi; and Schreiner, Herbert, 4,479,030, Cl. 174-48.000.

Plant Resources Institute: *See*—
Wochok, Zachary S.; and Sluis, Carolyn J., 4,478,000, Cl. 47-58.000.

Plantard, Dominique: *See*—
Battigelli, Jean A.; and Plantard, Dominique, 4,478,624, Cl. 65-4.400.

Plessey Overseas Limited: *See*—
Carrier, John A., 4,478,382, Cl. 248-185.000.

Plocher, Werner, to Maschinenfabrik Lauffer GmbH & Co. KG. Pressing apparatus with multi-platen or tiered presses. 4,478,673, Cl. 156-498.000.

Plowell, Dennis H.: *See*—
Paterson, Malcolm M.; and Plowell, Dennis H., 4,478,372, Cl. 241-35.000.

Pobortsev, Mendel E.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Polach, Wilhelm: *See*—
Brettschneider, Johannes; Dobler, Klaus; Haag, Gottlob; Linder, Ernst; and Polach, Wilhelm, 4,478,613, Cl. 55-127.000.

Polaroid Corporation: *See*—
Drevitch, Nolan A.; and Green, Lawrence E., 4,477,991, Cl. 40-158.00B.

Pollman, Frederic W., to Sundstrand Corporation. Hydraulic motor control. 4,478,041, Cl. 60-444.000.

Polson, Alfred: *See*—
Van der Merwe, Kirsten J.; and Polson, Alfred, 4,478,946, Cl. 436-518.000.

Pometto, Anthony L., III: *See*—
Crawford, Don L.; and Pometto, Anthony L., III, 4,478,747, Cl. 435-72.000.

Pons, Roberto E. Broken end piecing up apparatus for ring spinning frames. 4,478,035, Cl. 57-262.000.

Poock, Darwin N.; and Volkmann, Thomas J., to FMC Corporation. Telescopic boom with angled corner construction. 4,478,014, Cl. 52-115.000.

Pool, Danny J.: *See*—
Marhold, Werner; and Pool, Danny J., 4,479,038, Cl. 200-6.00A.

Poss, Eliasz; and Felsen, Marvin, to United Technologies Corporation. Corrosion resistant shim for electrically joining incompatible materials. 4,478,915, Cl. 428-607.000.

Postema, Pieter M., to ITT Industries, Inc. Valve construction. 4,478,387, Cl. 251-121.000.

PPG Industries, Inc.: *See*—
Criss, Russell C., 4,478,700, Cl. 204-192.00R.
Gillery, F. Howard; and Criss, Russell C., 4,478,702, Cl. 204-298.000.
Neely, James E., Jr.; and Jacobson, Annette M., 4,478,905, Cl. 428-324.000.

Prabhu, Vasant K.; and Steele, Raymond, to AT&T Bell Laboratories. Frequency-hopped single sideband mobile radio system. 4,479,226, Cl. 375-1.000.

Pratt, James W.: *See*—
Romano, Domenic R.; Henneberg, Hans H.; Pratt, James W.; and Coppelman, Maurice A., 4,479,198, Cl. 364-900.000.

Pratt, John W., Jr., to Monarch Marking Systems, Inc. Resilient optical connector between a light conductor and an ionization bulb. 4,478,484, Cl. 350-96.200.

Prechner, Roland: *See*—
Lecacheux, Didier; Lesec, James; and Prechner, Roland, 4,478,071, Cl. 073-55.000.

Precht, Hans, to Firestone Tire & Rubber Company, The. Device for joining plies for tires. 4,478,672, Cl. 156-421.000.

Precitronic Gesellschaft fur Feinmechanik und Electronics mbH: *See*—
Goda, Wilfried, 4,478,581, Cl. 434-22.000.

Preddey, Brian F., to Taboola Pty. Limited. Cylinder lock. 4,478,061, Cl. 70-358.000.

Premel, Ulrich: *See*—
Dorling, Rolf; and Premel, Ulrich, 4,478,606, Cl. 48-77.000.
Dorling, Rolf; and Premel, Ulrich, 4,478,608, Cl. 48-210.000.

Press/Seal Gasket Corp.: *See*—
Skinner, William O., 4,478,437, Cl. 285-189.000.

Prevette, Paul J. Multiple tool holder with retainer and drive socket. 4,478,539, Cl. 408-117.000.

Price, Alson K.: *See*—
Fanelli, Anthony J.; and Price, Alson K., 4,478,987, Cl. 526-97.000.

Price, Clifford A., to National Research Development Corporation. Stone treatment. 4,478,911, Cl. 428-332.000.

Pricone, Robert M.; and Montalbano, Anthony J., to Amerace Corporation. Method for forming an embossing tool with an optically precise pattern. 4,478,769, Cl. 264-1.600.

Procter & Gamble Company, The: *See*—
Baird, James C.; Japikse, Cornelis H.; and Kussin, Richard F., 4,478,858, Cl. 426-126.000.
Kong-Chan, Josephine L. Y., 4,478,754, Cl. 260-410.500.

Produits Chimiques Ugine Kuhlmann: *See*—
Blancou, Hubert; Commeyras, Auguste; and Teissedre, Robert, 4,478,760, Cl. 260-465.700.
Kervennal, Jacques; Cognion, Jean-Marie; and Braunstein, Pierre, 4,478,757, Cl. 260-453.0PC.

Prohaska, Hans: *See*—
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,478,004, Cl. 49-72.000.

Propster, Mark A.: *See*—
Hohman, Charles M.; Propster, Mark A.; Dunn, Charles; and Seng, Stephen, 4,478,627, Cl. 65-27.000.

Proszynski, Lech: *See*—
Di Giovanni, John; Failla, Steven; Huebscher, Laszlo; Pedlick, John S.; Menges, John R.; and Proszynski, Lech, 4,478,220, Cl. 128-326.000.

Prototech Company: *See*—
Allen, Robert J., 4,478,696, Cl. 204-105.00R.

Provder, Theodore: *See*—
Holsworth, Richard M.; and Provder, Theodore, 4,478,073, Cl. 73-61.400.

Prusak, John J.; and Patel, Bhupendra P., to RCA Corporation. Apparatus for injection molding an article. 4,478,566, Cl. 425-149.000.

Pulliam, George R., to Litton Systems, Inc. Method of manufacturing a multilayer magneto-optic device. 4,478,872, Cl. 427-38.000.

Pullukat, Thomas J.; and Hoff, Raymond E., to Cheraplex Company. Polymerization method. 4,478,988, Cl. 526-128.000.

Puntar, Joseph; and Parham, B. J., to Hydril Company. Retrievable inside blowout preventer valve apparatus. 4,478,279, Cl. 166-121.000.

Puri, Avinash D.; Rodosevich, James B.; and Fairchild, James L., to Kerr-McGee Chemical Corporation. Method of continuously controlling crystal fines formation. 4,478,599, Cl. 23-300.000.

Puro, Nicholas S., to Microdent Industries. Box joint employing screw pivot pin for adjustable tightening. 4,478,532, Cl. 403-157.000.

Putnam, Gary C.: *See*—
Maricle, Donald L.; Putnam, Gary C.; and Stewart, Robert C., Jr., 4,478,776, Cl. 264-83.000.

QO Chemicals, Inc.: *See*—
Akerberg, Denis W., 4,478,269, Cl. 164-21.000.

Raba, Carl F., Jr.; Smith, Robert L.; and Huang, Francis Y., to Monier Resources, Inc. Composition and process for the treatment of clay slimes. 4,478,736, Cl. 252-180.000.

Rabatin, Jacob G., to General Electric Company. Multi-layer X-ray screens. 4,478,933, Cl. 430-496.000.

Radtke, Robert P., to Strata Bit Corporation. Drill bit having cutting elements with heat removal cores. 4,478,297, Cl. 175-329.000.

Raizon, Bernard: *See*—
Kaplan, Jean-Pierre; and Raizon, Bernard, 4,478,851, Cl. 424-330.000.

Raj, Kuldip, to Ferrofluidics Corporation. Ferrofluid seal apparatus and method. 4,478,424, Cl. 277-80.000.

Rangaswamy, Avvari. Tamper-resistant container. 4,478,341, Cl. 215-12.00R.

Ranger, Martial, to Canadian Patents & Development Limited. Vacuum coating vessel with movable shutter plate. 4,478,174, Cl. 118-718.000.

Raninger, Franz, to Chemie Linz Aktiengesellschaft. Process for the preparation of phenylpyridazine compounds. 4,478,999, Cl. 544-241.000.

Ranke, Gerhard: *See*—
Bengeser, Georg; and Ranke, Gerhard, 4,478,799, Cl. 423-224.000.

Raudenbusch, Werner T.: *See*—
Bekooij, Jurrianus; Raudenbusch, Werner T.; Stachowiak, Stephen A.; Kooijmans, Petrus G.; and Scholten, Henricus P. H., 4,478,985, Cl. 525-530.000.

Ray, Siba P., to Aluminum Company of America. Inert electrode compositions. 4,478,693, Cl. 204-64.00R.
Raychem Corporation: *See—*
Fentress, Vernon A.; and Comet, Francois, 4,478,486, Cl. 350-96.200.
Raychem Ltd.: *See—*
McLoughlin, Robert H., 4,478,252, Cl. 138-140.000.
Raymond, A.: *See—*
Pittion, Philippe; Andre, Guy; Souillard, Gerald; J'espere, Jean-Louis; and Houte, Bernard, 4,478,381, Cl. 248-71.000.
Raymond, Edward L.: *See—*
Becker, James R.; Raymond, Edward L.; and Cameron, David W., 4,477,955, Cl. 29-157.10R.
Raymond Kaiser Engineers Inc.: *See—*
Hyde, Jack, 4,478,575, Cl. 432-217.000.
Raytheon Company: *See—*
Harris, David J., 4,479,094, Cl. 330-261.000.
Moghe, Sanjay B.; Gray, Roger E.; and Tsai, Wei, 4,479,100, Cl. 333-33.000.
Paterson, Malcolm M.; and Plowell, Dennis H., 4,478,372, Cl. 241-35.000.
RCA Corporation: *See—*
Baar, Louis S., 4,478,472, Cl. 339-75.00M.
Daniel, James W., Jr., 4,479,253, Cl. 455-226.000.
Griffis, Patrick D., 4,479,235, Cl. 381-17.000.
Hertzler, Merle E., 4,478,172, Cl. 118-612.000.
Prusak, John J.; and Patel, Bhupendra P., 4,478,566, Cl. 425-149.000.
Welch, Patrick G.; and Mitchell, Everett E., 4,478,701, Cl. 204-298.000.
RE-AL, Inc.: *See—*
Ditzig, Albert F., 4,478,364, Cl. 228-201.000.
Rebafka, Walter: *See—*
Klahr, Erhard; Rebafka, Walter; Nissen, Axel; Trieselt, Wolfgang; and Hettche, Albert, 4,479,016, Cl. 568-606.000.
Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, to Hoechst Aktiengesellschaft. Process for improving the activity of used supported silver catalysts. 4,478,948, Cl. 502-25.000.
Redding, Donald E. Therapeutic limb manipulator. 4,478,213, Cl. 128-25.00R.
Rediker, Robert H., to Massachusetts Institute of Technology. Fiber-coupled external cavity semiconductor laser. 4,479,224, Cl. 372-92.000.
Redman, Brian E.; and Woods, Gordon D., to AT&T Bell Laboratories. Remotely controlled switched access to the console port of an electronic computer. 4,479,122, Cl. 340-825.060.
Reed, Jerry O.; and Mathis, Ronald D., to Phillips Petroleum Company. Polymer stabilization. 4,478,969, Cl. 524-106.000.
Rees, James G., to Page, William R., a part interest. Strainer arrangement for combined dirt collector and cut out cocks. 4,478,617, Cl. 55-314.000.
Reghezza, Andres: *See—*
Wilkomirsky, Igor; Reghezza, Andres; and Petit-Laurent, Hector, 4,478,698, Cl. 204-106.000.
Regie Nationale des Usines Renault: *See—*
Buannec, Michel, 4,478,107, Cl. 74-863.000.
Rehrig, Houston. Hand carrying basket. 4,478,344, Cl. 220-83.000.
Reich, Shymon: *See—*
Vofsi, David; Reich, Shymon; Tchoukran, Israel; and Mayoral, Joaquin, 4,478,770, Cl. 264-2.100.
Reid, William J., to Ciba-Geigy Corporation. Tri-N-substituted-s-triazine-trione chain terminator for polyvinyl chloride polymerization. 4,478,986, Cl. 526-83.000.
Reis, Edmund: *See—*
Rosenfeldt, Bernd; Weller, Gerhard; Wondra, Arthur; and Reis, Edmund, 4,479,263, Cl. 455-602.000.
Reliance Electric Company: *See—*
Cates, Robert P., 4,479,174, Cl. 363-21.000.
Renard, Pierre: *See—*
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,478,707, Cl. 208-157.000.
Renault Vehicules Industriels: *See—*
Pernet, Jean-Paul, 4,478,178, Cl. 123-41.010.
Renfroe, Harris B., to Ciba-Geigy Corporation. N-Substituted-2-pyridylindoles. 4,478,842, Cl. 424-263.000.
Repligen Corporation: *See—*
Herlihy, Walter C., 4,478,936, Cl. 435-78.000.
Rewcastle, Gordon W.; Atwell, Graham J.; Baguley, Bruce C.; and Denny, William A., to Development Finance Corporation of New Zealand. Certain acridinyl-phosphoramidate compounds. 4,479,000, Cl. 546-23.000.
Rexnord Inc.: *See—*
Gieschen, John A., 4,478,373, Cl. 241-208.000.
Rheinische Braunkohlenwerke AG: *See—*
Velling, Gunther; and Brungel, Norbert, 4,478,725, Cl. 210-703.000.
Rheinmetall GmbH.: *See—*
Backstein, Gunter; Unger, Hans W.; Gunther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,478,149, Cl. 102-426.000.
Rhines, David W., to Silver Creek Nurseries, Inc. Sound detecting device. 4,479,239, Cl. 381-72.000.
Rhodes, Buck A.: *See—*
Burchiel, Scott W.; Rhodes, Buck A.; and Crockford, David R., 4,478,815, Cl. 424-1.100.
Rhone-Poulenc Agrochimie: *See—*
Gros, Georges; and Molin, Marc, 4,479,006, Cl. 548-312.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Soula, Gerard, 4,479,022, Cl. 570-202.000.
Ribeyre, Jean-Paul: *See—*
Baugh, Benton F.; Lux, Gerard J-M.; and Ribeyre, Jean-Paul, 4,478,292, Cl. 173-149.000.
Richard Hirschmann Radiotechnisches Werk: *See—*
Zierhut, Hermann, 4,479,056, Cl. 250-342.000.
Richard, Jean: *See—*
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Richardson, Bobby J. Guiding light system. 4,479,170, Cl. 362-95.000.
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Morin, George A.; and Richardson, Raymond H., 4,478,399, Cl. 270-55.000.
Richman, Charles D., Jr. Drill bit having multiple drill rod impact members. 4,478,296, Cl. 175-92.000.
Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, 4,478,745, Cl. 260-112.50R.
Ricoh Company, Ltd.: *See—*
Sakano, Yukio, 4,479,119, Cl. 340-731.000.
Riebli, Peter: *See—*
Hubele, Adolf; and Riebli, Peter, 4,479,004, Cl. 548-101.000.
Rieskamp, Klaus: *See—*
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Rieter Machine Works, Ltd.: *See—*
Binder, Rolf; and Hanselmann, Daniel, 4,477,944, Cl. 19-80.00R.
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Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,854, Cl. 426-12.000.
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,856, Cl. 426-46.000.
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,939, Cl. 435-200.000.
Alder-Nissen, Jens L.; Gurtler, Henrick; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,940, Cl. 435-209.000.
Riker Laboratories, Inc.: *See—*
Wade, James J., 4,478,835, Cl. 424-246.000.
Rilling, Raymond J.: *See—*
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,478,026, Cl. 56-7.000.
Ring, Curt: *See—*
Tomm, Wayne R.; and Ring, Curt, 4,478,284, Cl. 166-297.000.
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Martin, Eugene G.; and Risser, Dale M., 4,477,942, Cl. 17-11.000.
Rita, Robert A., to International Business Machines Corporation. Gas panel seal glass. 4,478,947, Cl. 501-15.000.
Ritter, Frank; and Balordi, Romano, to Maryland Cup Corporation. Digital feed system. 4,478,121, Cl. 83-209.000.
Riva, Merate: *See—*
Sarfati, Alberto G.; Bianchi, Massimiliano; and Riva, Merate, 4,478,375, Cl. 242-47.010.
Robbins, Gordon B., to Du Pont de Nemours, E. I., and Company. Titanate compositions having depressed freezing points. 4,478,755, Cl. 260-429.500.
Robert Bosch GmbH: *See—*
Auer, Hugo, 4,478,262, Cl. 141-114.000.
Bauer, Hartmut; Bonse, Bernhard; and Schmidt, Peter, 4,478,186, Cl. 123-436.000.
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; Schramm, Herbert; and Viess, Walter, 4,478,068, Cl. 73-35.000.
Brettschneider, Johannes; Dobler, Klaus; Haag, Gottlob; Linder, Ernst; and Polach, Wilhelm, 4,478,613, Cl. 55-127.000.
Dorenkamp, Richard; Faupel, Werner; Geyer, Gerhard; and Jager, Erich, 4,478,195, Cl. 123-502.000.
Eheim, Franz, 4,478,188, Cl. 123-450.000.
Heiser, Joachim; Leutner, Volkmar; Schuttenberg, Eckard; and Weigle, Dieter, 4,478,136, Cl. 91-506.000.
Leiber, Heinz, 4,478,461, Cl. 303-92.000.
Misch, Wolfgang; Freytag, Adolf; and Henning, Manfred, 4,478,183, Cl. 123-339.000.
Seiler, Hartmut, 4,479,095, Cl. 330-261.000.
Robert Shaw Controls Company: *See—*
Payne, Frank, 4,479,039, Cl. 200-67.00D.
Roberto, Scorta, to Italtel Societa Italiana Telecomunicazioni S.P.A. Method for conductively interconnecting circuit components on opposite surfaces of a dielectric layer. 4,478,882, Cl. 427-97.000.
Roberts, Gerald E.: *See—*
Crescenzi, Robert J.; Daniels, John U., Jr.; and Roberts, Gerald E., 4,477,952, Cl. 29-25.350.
Roby, Gerard: *See—*
Durand, Guy; and Roby, Gerard, 4,478,478, Cl. 339-263.00R.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Trisubstituted pyrimido[5,4-d]pyrimidines and salts thereof. 4,478,833, Cl. 424-246.000.
Rockwell International Corporation: *See—*
Clark, James R., 4,478,137, Cl. 92-63.000.
Craiglow, Robert L., 4,479,254, Cl. 455-239.000.
Cumming, James C., 4,478,459, Cl. 303-7.000.
Davidson, Donald J., 4,478,316, Cl. 188-71.900.

Dawson, Sylvan L., 4,479,251, Cl. 455-219.000.
Fowks, William R., 4,479,096, Cl. 331-3.000.
Godejahn, Gordon C., Jr., 4,477,962, Cl. 29-571.000.
Koch, Ronald N.; and Yanov, David A., 4,478,440, Cl. 285-392.000.
Sheill, David D., 4,478,317, Cl. 188-71.900.
Siniscal, Paul D.; Benzing, J. Paige; and Matte, Louis G., 4,478,327, Cl. 193-40.000.

Rodosevich, James B.: *See*—
Puri, Avinash D.; Rodosevich, James B.; and Fairchild, James L., 4,478,599, Cl. 23-300.000.

Rodriguez, Arthur M.; and Watkins, Larry L., to Texas Instruments Incorporated. Synthesized voice radio paging system. 4,479,124, Cl. 340-825.440.

Rodriguez, Domingo H. Piano sound board. 4,478,125, Cl. 84-212.000.

Roe, Robert J.: *See*—
Lang, Curtis E.; and Roe, Robert J., 4,477,992, Cl. 43-4.000.

Rogers, James E.; Warniak, James S.; Hobrock, Lowell M.; Bafico, Michael A.; and Scheele, Stephen R., to Hughes Aircraft Company. Thermal protective shield for antenna reflectors. 4,479,131, Cl. 343-872.000.

Rogers, Noel A. Electronic channel selector. 4,479,247, Cl. 455-179.000.

Roggenburg, Stanley L., Jr.; and Laauwe, Robert H., to Essex Chemical Corporation. Flexible-bag self-closing metering dispensing valve. 4,478,356, Cl. 222-94.000.

Rogut, Samuel. Material which has abrasive properties and method of making same. 4,477,938, Cl. 15-118.000.

Rohde, Siegfried: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; Schramm, Herbert; and Viess, Walter, 4,478,068, Cl. 73-35.000.

Roland Corporation: *See*—
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Rolles, Rolf: *See*—
Christini, Roy A.; Rolles, Rolf; Bowman, Kenneth A.; and Ballain, Marlyn D., 4,478,637, Cl. 75-67.00R.

Romada Holdings Ltd.: *See*—
Maijer, Rolf; and Starck, James W., 4,478,576, Cl. 433-3.000.

Romano, Domenic R.; Henneberg, Hans H.; Pratt, James W.; and Coppelman, Maurice A., to Honeywell Information Systems Inc. Modular computer system. 4,479,198, Cl. 364-900.000.

Rones, Josef; Moller, Siegfried; and Moesner, Kurt, to Parker Chemical Company. Process for the treatment of spent pickling paste. 4,478,647, Cl. 134-13.000.

Rosch, Gunter: *See*—
Adrian, Klaus; and Rosch, Gunter, 4,478,737, Cl. 252-186.250.

Rosenbaum, Ralph L.; and Breuer, Ami S. Heat-exchanger particularly useful for low temperature applications, and method and apparatus for making same. 4,478,276, Cl. 165-164.000.

Rosenberg, George N.: *See*—
Barnes, Derek; Dessens, Jan A. H.; and Rosenberg, George N., 4,478,896, Cl. 427-421.000.

Rosenfeldt, Bernd; Weller, Gerhard; Wondra, Arthur; and Reis, Edmund, to Siemens Aktiengesellschaft. Device for acquiring and processing electrical signals. 4,479,263, Cl. 455-602.000.

Rosenthal, Hyman; and Hammond, Harry W., to Interlake, Inc. Apparatus for casting low-density alloys. 4,478,270, Cl. 164-254.000.

Ross, Sidney D.; and Finkelstein, Manuel, to Sprague Electric Company. Electrolytic capacitor. 4,479,167, Cl. 361-433.000.

Ross, Sidney D.: *See*—
Finkelstein, Manuel; Dunkl, Franz C.; and Ross, Sidney D., 4,479,166, Cl. 361-433.000.

Rossini, Ernest M., to Crosfield Data Systems, Inc. Method of and apparatus for feeding and positioning material to be scanned. 4,479,147, Cl. 358-290.000.

Rossmann, Axel: *See*—
Huther, Werner; and Rossmann, Axel, 4,478,790, Cl. 419-54.000.

Rotenberg, Don H.: *See*—
Masso, Jon D.; Brennan, William D.; and Rotenberg, Don H., 4,478,873, Cl. 427-40.000.

Rotter, Gerhard, to Luk Lamellen und Kupplungsbau GmbH. Clutch plate. 4,478,326, Cl. 192-106.200.

Roura, Miguel J., to Du Pont de Nemours, E. I., and Company. Toughened polyamide blends. 4,478,978, Cl. 525-66.000.

Roussel Rclaf: *See*—
Hercelin, Bernard; Mary, Irene; and Nung, Vien N., 4,478,819, Cl. 424-37.000.

Roussel Uclaf: *See*—
Tessier, Jean; Demoute, Jean-Pierre; and Bonin, Werner, 4,478,850, Cl. 424-304.000.

Rozario, Rodney A.: *See*—
Dujovny, Manuel; and Rozario, Rodney A., 4,478,219, Cl. 128-325.000.

Rozmus, Walter J.; and Dietrich, Jerry L., to Kelsey-Hayes Company. Method of sealing a container. 4,478,788, Cl. 419-48.000.

Rudolf, Ulrich; and Vetter, Martin, to Landis & Gyr Aug AG. Static audio-frequency control receiver. 4,479,262, Cl. 455-352.000.

Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for severing cigarette rods or the like. 4,478,231, Cl. 131-84.00C.

Ruin, Jean-Pierre, to Jean-Claude Robin. Container for printed-circuit boards. 4,478,331, Cl. 206-334.000.

Rukavina, Daniel M.; and Arnold, David H. Automatic control system for machine tools. 4,478,009, Cl. 51-165.800.

Rummel, Mitzie K.: *See*—
Concannon, Thomas P.; and Rummel, Mitzie K., 4,478,965, Cl. 523-218.000.

Rumpakis, George E. Lighted instrument assembly. 4,479,173, Cl. 362-294.000.

Rumsa, Antanas J. Mechanical transmission apparatus. 4,478,101, Cl. 74-325.000.

Rupp, Warren E., to Warren Rupp Company, The. Fluid-operated reciprocating pump. 4,478,560, Cl. 417-393.000.

Rusch, Daniel: *See*—
Auzet, Christian; Rusch, Daniel; and Chabernaud, Daniel, 4,479,230, Cl. 375-108.000.

Russell, Alexander H.; McClinton, John L.; and Sergovic, John A., to Burns & Russell Company, The. Electrolessly plated mold surface and method of using. 4,478,779, Cl. 264-319.000.

Russell, Larry A.: *See*—
Herr, Diane E.; Metz, Reinhard; and Russell, Larry A., 4,479,195, Cl. 364-900.000.

Russell, Richard H., to Norton Co. Hand sander. 4,478,011, Cl. 51-360.000.

Ruti Machinery Works, Ltd.: *See*—
Honegger, Rolf, 4,478,259, Cl. 139-435.000.

Ryan, Philip M., to International Business Machines Corporation. System for updating error map of fault tolerant memory. 4,479,214, Cl. 371-11.000.

Rychlewski, Thaddeus V., to North American Philips Consumer Electronics Corp. Depression cathode structure for cathode ray tubes having surface smoothness and method for producing same. 4,478,590, Cl. 445-50.000.

S. C. Johnson & Son, Inc.: *See*—
Chaussee, James G., 4,478,853, Cl. 424-358.000.

S.N.E.C.M.A.: *See*—
Surdi, Jean M., 4,478,554, Cl. 416-221.000.

Sachot, Michel, to Centre D'Etudes Du Fraisage. Spindle head assembly with oblique axis of rotation. 4,478,540, Cl. 409-211.000.

Sachs, Hanns I.: *See*—
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, 4,478,738, Cl. 252-188.310.

Sachs, Isaac. Dead-end messenger wire holder. 4,477,948, Cl. 24-115.00R.

Sadamasu, Toshiaki: *See*—
Watanabe, Osamu; Tanaka, Hisashi; Yoshino, Hitoshi; and Sadamasu, Toshiaki, 4,478,767, Cl. 261-130.000.

Sagawa, Koichiro: *See*—
Ogino, Keizo; Takehara, Masahiro; Miyoshi, Takeshi; and Sagawa, Koichiro, 4,478,734, Cl. 252-117.000.

Saget, Pierre. Centrifugal separation apparatus. 4,478,718, Cl. 210-512.300.

Saito, Atsunori: *See*—
Naganoma, Masanori; Kato, Yoshiharu; Saito, Atsunori; Hara, Yoshimichi; and Matsushima, Katsuaki, 4,478,274, Cl. 165-12.000.

Saito, Hidefumi; Hayashi, Munehiro; Mitani, Hisashi; Isaka, Hiromu; and Andoh, Masanao, to Shimadzu Corporation. Cryogenic refrigerator. 4,478,046, Cl. 62-6.000.

Saitoh, Mitsuo; Kamiyama, Yasuo; and Murata, Mitsuhiro, to Citizen Watch Company Limited. Arrangement of analog-type electronic wristwatch. 4,478,524, Cl. 368-204.000.

Sakaguchi, Masaaki; Satoh, Shinichi; Kiuchi, Seiji; and Chikamasa, Hiroshi, to Fuji Photo Film Co., Ltd. Method of winding magnetic recording tape. 4,478,376, Cl. 242-191.000.

Sakaguchi, Shigeya; Shiroyama, Masaharu; and Ito, Hiroshi, to Nippon Tungsten Co., Ltd. Method for hardfacing a ferrous base material. 4,478,871, Cl. 427-34.000.

Sakai, Junzo: *See*—
Endo, Gen; Hori, Hirokazu; Kawada, Yoshihiro; and Sakai, Junzo, 4,478,775, Cl. 264-40.300.

Sakamoto, Shigeru: *See*—
Okada, Minoru; Sone, Takeo; Sakamoto, Shigeru; Koizumi, Yuji; and Tsuda, Iwao, 4,478,541, Cl. 409-232.000.

Sakano, Yukio, to Ricoh Company, Ltd. CRT Display device. 4,479,119, Cl. 340-731.000.

Sakoe, Hiroaki, to Nippon Electric Co., Ltd. Pattern matching device operable with signals of a compressed dynamic range. 4,479,236, Cl. 381-43.000.

Sakurai, Kazuhiro: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,479,068, Cl. 310-194.000.

Salathiel, Andrew: *See*—
Diwell, Alan F.; and Salathiel, Andrew, 4,478,797, Cl. 423-213.500.

Salminen, Arthur H., to Hopeman Brothers, Inc. Modular bathroom installation. 4,477,934, Cl. 4-663.000.

Salomaa, Kari; Merrill, Roy; Leath, Richard; Wennberg, Timothy; and Widunas, Joseph, to Cetus Corporation. Liquid sample handling system. 4,478,094, Cl. 73-863.320.

Samal, Prasanna K.: *See*—
Nadkarni, Anil V.; Samal, Prasanna K.; Wang, James C.; and Sunk, James E., 4,478,787, Cl. 419-8.000.

Sambucetti, Carlos J.: *See*—
Bupp, James R.; Markovich, Voya; Napp, Tracy E.; and Sambucetti, Carlos J., 4,478,883, Cl. 427-97.000.

Samek, Norbert E., to Transamerica Delaval Inc. Light gate assemblies, elements and manufacturing methods. 4,478,495, Cl. 350-392.000.

Samsonite Corporation: *See*—
Gregg, James S., 4,477,941, Cl. 16-289.000.

Sanchez, Ruben; and McEver, R. M., Jr., to Daniel Industries, Inc. Orifice fitting seal assembly. 4,478,251, Cl. 138-44.000.

Sanderson, Arnold R., to National Research Development Corporation. Immunological preparations containing purified MHC antigens bonded to other antigens. 4,478,823, Cl. 424-88.000.
Sandoz Ltd.: *See*—
Gadient, Fulvio, 4,478,750, Cl. 260-245.700.
Keller-Juslen, Camilla; Kuhn, Max; and King, Hamilton D., 4,478,831, Cl. 424-181.000.
Schenker, Erhard, 4,478,837, Cl. 424-250.000.
Sandstrom, Paul H.: *See*—
Lal, Joginder; and Sandstrom, Paul H., 4,478,980, Cl. 525-187.000.
Wideman, Lawson G.; and Sandstrom, Paul H., 4,478,993, Cl. 527-600.000.
Sanmiya, Tsugumi: *See*—
Umemoto, Yoshiro; and Sanmiya, Tsugumi, 4,478,447 Cl. 293-102.000.
Sanner, Axel: *See*—
Goertz, Hans-Helmut; Marcinowski, Stefan; and Sanner, Axel, 4,478,976, Cl. 525-54.100.
Santa Barbara Research Center: *See*—
Parrish, William J., 4,479,139, Cl. 357-24.000.
Santorineos, Christos. Balloon-printing apparatus with silk-screen. 4,478,142, Cl. 101-35.000.
Santrade Ltd.: *See*—
Okada, Minoru; Sone, Takeo; Sakamoto, Shigeru; Koizumi, Yuji; and Tsuda, Iwao, 4,478,541, Cl. 409-232.000.
Sapian, Vladimir G.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.
Sarai, Masahiro: *See*—
Okuno, Ryuzo; Toyoda, Keio; Sarai, Masahiro; and Takai, Kiyoshi, 4,478,574, Cl. 432-180.000.
Sarfati, Alberto G.; Bianchi, Massimiliano; and Riva, Merate, to Sobrevin Societe de brevets industriels-Etablissment. Conveying device for continuous threads. 4,478,375, Cl. 242-47.010.
Sasaki, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasound diagnosis apparatus. 4,478,085, Cl. 73-625.000.
Sasson, Yoel; and Zbaida, Shmuel, to GADOT, Petrochemical Industries, Ltd. Process for the manufacture of nitrophenetoles. 4,479,015, Cl. 568-584.000.
Sato, Ichiya; Yoneyama, Takao; Koga, Tsuguaki; Ikeuchi, Kazuo; and Hisano, Katsukuni, to Hitachi, Ltd. Method and apparatus for detecting rubbing in a rotary machine. 4,478,082, Cl. 73-593.000.
Sato, Kazuhiko; Nakamura, Genshiro; and Yukimoto, Yoshinori, to Director General of Agency of Industrial Science and Technology. Amorphous solar cell. 4,479,028, Cl. 136-249.000.
Sato, Kozo: *See*—
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; and Sato, Kozo, 4,478,927, Cl. 430-203.000.
Sato, Masashi; and Sugo, Yasuhisa, to Fujitsu Limited. Semiconductor memory device. 4,479,200, Cl. 365-175.000.
Sato, Tomokazu; and Ui, Michio, to Yamasa Shoyu Kabushiki Kaisha. Determination of adenosine by immunoassay involving acylation of the adenosine. 4,478,934, Cl. 435-7.000.
Satoh, Kenzoh: *See*—
Mayumi, Yoshishige; Satoh, Kenzoh; Hasegawa, Kenji; and Takahashi, Mitsuyoshi, 4,478,899, Cl. 428-72.000.
Satoh, Shinichi: *See*—
Sakaguchi, Masaaki; Satoh, Shinichi; Kiuchi, Seiji; and Chikamasa, Hiroshi, 4,478,376, Cl. 242-191.000.
Sawada, Daisaku: *See*—
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.
Sayler, William M.; and Hayner, John M., to United States of America, Army. Cartridge with elastic pusher cup. 4,478,150, Cl. 102-430.000.
Scanlan, Gregory P. Vacuum packing device. 4,478,025, Cl. 53-512.000.
Schabowski, John, to Texas Instruments Incorporated. Quadruply time-multiplex information bus. 4,479,178, Cl. 364-200.000.
Schaedlich, Renate: *See*—
Moraw, Roland; and Schaedlich, Renate, 4,478,924, Cl. 430-126.000.
Schaer, Leonard S., to Tekcast Associates, Inc. Front loading centrifugal spin caster. 4,478,567, Cl. 425-150.000.
Schafer, Fritz P.: *See*—
Bor, Zsolt; and Schafer, Fritz P., 4,479,220, Cl. 372-25.000.
Schauder, Colin D.; and Caddy, Roy, to General Electric Company p.l.c., The. Motor control system. 4,479,082, Cl. 318-799.000.
Schauer, Wolfgang: *See*—
Krevet, Berthold; Schauer, Wolfgang; and Wuchner, Fritz, 4,478,877, Cl. 427-62.000.
Scheck, Georg, to Geze GmbH. Ski safety binding. 4,478,426, Cl. 280-625.000.
Scheele, Stephen R.: *See*—
Rogers, James E.; Warniak, James S.; Hobrock, Lowell M.; Bafico, Michael A.; and Scheele, Stephen R., 4,479,131, Cl. 343-872.000.
Schenker, Erhard, to Sandoz Ltd. 3-Hydrazino cycloalkyl[c]pyridazines as antihypertensive agents. 4,478,837, Cl. 424-250.000.
Schilling, Peter; and Schreuders, Hans G., to Westvaco Corporation. Amphoterics as emulsifiers for bituminous emulsions. 4,478,642, Cl. 106-277.000.
Schippers, Heinz; and Hertell, Siegfried, to Barmag Barmer Maschinenfabrik AG. Oil lubrication of vacuum pump with pulsating oil feed. 4,478,562, Cl. 418-88.000.
Schleier, Gisbert: *See*—
Buethe, Ingolf; Marx, Matthias; Schleier, Gisbert; and Peters, Reinhard, 4,478,960, Cl. 521-160.000.
Schlumberger Technology Corporation: *See*—
Baugh, Benton F.; Lux, Gerard J-M.; and Ribeyre, Jean-Paul, 4,478,292, Cl. 173-149.000.
Schmidt, Peter: *See*—
Bauer, Hartmut; Bonse, Bernhard; and Schmidt, Peter, 4,478,186, Cl. 123-436.000.
Schmidt, Wilfred O.: *See*—
Wenger, Harvey, 4,477,984, Cl. 34-128.000.
Schneider, George W., Jr.: *See*—
Hicks, Irwin A.; and Schneider, George W., Jr., 4,478,078, Cl. 73-253.000.
Schoen, Erich W.; and Tice, Lee D., to Pittway Corporation. Line-gated switching power supply. 4,478,468, Cl. 315-291.000.
Schoener, Ronald C.; King, Larry K.; Knap, Lester L.; and Kloap, Nicholas, to Aluminum Company of America. Process for recovery of aluminum chloride. 4,478,600, Cl. 23-313.0FB.
Scholl, Hans-Joachim; Sachs, Hanns I.; Jabs, Gert; and Loew, Gunther, to Bayer Aktiengesellschaft. Self-releasing binder based on isocyanate and the use thereof in a process for the production of molded articles. 4,478,738, Cl. 252-188.310.
Scholten, Henricus P. H.: *See*—
Bekooij, Jurrianus; Raudenbusch, Werner T.; Stachowiak, Stephen A.; Kooijmans, Petrus G.; and Scholten, Henricus P. H., 4,478,985, Cl. 525-530.000.
Scholtens, Eltjo, to U.S. Philips Corporation. Method of partially metallizing electrically conductive non-metallic patterns. 4,478,690, Cl. 204-15.000.
Schonfelder, Manfred; Haas, Peter; Avar, Geza; and Steinberger, Helmut, to Bayer Aktiengesellschaft. Polyisocyanate addition products useful as mold release agents and a process for their production. 4,478,893, Cl. 427-387.000.
Schonherr, Walter: *See*—
Gaugel, Manfred; and Schonherr, Walter, 4,479,072, Cl. 313-113.000.
Schopper, Alf: *See*—
Vignon, Louis; and Schopper, Alf, 4,477,945, Cl. 19-236.000.
Schott, Marcel, to Messier-Hispano-Bugatti(s.a.). Hydraulic power transducer. 4,478,557, Cl. 417-271.000.
Schramm, Herbert: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; Schramm, Herbert; and Viess, Walter, 4,478,068, Cl. 73-35.000.
Schreiber, Herbert. Method of manufacturing fibre-reinforced plastic articles, a prepreg for the manufacture of fibre-reinforced plastic articles and a fibre-reinforced plastic article. 4,478,771, Cl. 264-22.000.
Schreiner, Friedrich, to Zahnradfabrik Friedrichshafen, AG. Multigear transmission system shiftable under load. 4,478,106, Cl. 74-740.000.
Schreiner, Herbert: *See*—
Votteler, Arno; Danuzzi, Max; Dubach, Fredi; and Schreiner, Herbert, 4,479,030, Cl. 174-48.000.
Schreuders, Hans G.: *See*—
Schilling, Peter; and Schreuders, Hans G., 4,478,642, Cl. 106-277.000.
Schroeder, Clifford A.; and Fogg, Ralph L., to C. A. Schroeder, Inc. Method for strengthening duct cores. 4,478,657, Cl. 156-64.000.
Schuettenberg, Alexander D., to Phillips Petroleum Company. Gasoline compositions containing branched chain amines or derivatives thereof. 4,478,604, Cl. 44-63.000.
Schulein, Martin: *See*—
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,854, Cl. 426-12.000.
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,856, Cl. 426-46.000.
Adler-Nissen, Jens L.; Gurtler, Henrik; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,939, Cl. 435-200.000.
Alder-Nissen, Jens L.; Gurtler, Henrick; Jensen, Georg W.; Olsen, Hans A. S.; Riisgaard, Steen; and Schulein, Martin, 4,478,940, Cl. 435-209.000.
Schulte-Elte, Karl H.; Snowden, Roger L.; and Muller, Bernard L., to Firmenich SA. Process for the preparation of polyunsaturated cycloaliphatic ketones. 4,479,011, Cl. 568-361.000.
Schulz, Gunter; Buschmann, Ernst; and Zeeh, Bernd, to BASF Aktiengesellschaft. Preparation of Schiff bases of aminocycloalkanecarboxylic acids esters. 4,478,758, Cl. 260-465.00D.
Schulz, Gunter: *See*—
Michele, Helmut; Schulz, Gunter; and Werner, Udo, 4,478,719, Cl. 210-641.000.
Schurter, Rolf: *See*—
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,478,635, Cl. 71-92.000.
Schussler, Karl-Heinz: *See*—
Brucher, Eberhard; and Schussler, Karl-Heinz, 4,478,451, Cl. 294-106.000.

Schust, Gerhard: *See*—
Hess, Peter; Muhling, Gunter; and Schust, Gerhard, 4,478,099, Cl. 74-11.000.

Schuttenberg, Eckard: *See*—
Heiser, Joachim; Leutner, Volkmar; Schuttenberg, Eckard; and Weigle, Dieter, 4,478,136, Cl. 91-506.000.

Schutz, Bernard R., to Fine Art Pillow & Specialties Corp. Adjustable cover for infant car seat. 4,478,453, Cl. 297-219.000.

Schweyen, Paul R.: *See*—
Parekh, Dhan N.; and Schweyen, Paul R., 4,478,610, Cl. 51-298.000.

SCM Corporation: *See*—
Holsworth, Richard M.; and Provder, Theodore, 4,478,073, Cl. 73-61.400.
Nadkarni, Anil V.; Samal, Prasanna K.; Wang, James C.; and Sunk, James E., 4,478,787, Cl. 419-8.000.

Scudo, Aldo: *See*—
Lewis, Arthur M.; and Scudo, Aldo, 4,479,136, Cl. 346-140.00R.

Secure Keyboards Limited: *See*—
Hirsch, Steven B., 4,479,112, Cl. 340-365.0VL.

Seebacher, Gerhard: *See*—
Pachonik, Horst; and Seebacher, Gerhard, 4,478,875, Cl. 427-41.000.

Seider, Werner: *See*—
Kochndorfer, Michael; Kurtz, Rudiger; Meurer, Werner; Seider, Werner; and Storr, Helmut, 4,478,684, Cl. 162-337.000.

Seiko Instruments & Electronics Ltd.: *See*—
Tabata, Junichi, 4,479,121, Cl. 340-785.000.

Seiler, Hartmut, to Robert Bosch GmbH. Integrated circuit amplifier for low input voltages. 4,479,095, Cl. 330-261.000.

Seisu Kogyo Co., Ltd.: *See*—
Hasegawa, Tsuneo; Nakahara, Kiyoharu; and Hasegawa, Seitaro, 4,478,716, Cl. 210-289.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Endo, Gen; Hori, Hirokazu; Kawada, Yoshihiro; and Sakai, Junzo, 4,478,775, Cl. 264-40.300.

Selden, Gary F., to Hughes Tool Company. Method of making tungsten carbide grit. 4,478,611, Cl. 51-307.000.

Sellers, Janet R. Teaching device for severely retarded or physically handicapped. 4,478,583, Cl. 434-259.000.

Selli, Marino, to Fata Industriale S.p.A. Plant and method for regenerating sand from foundry cores and moulds by calcination in a fluidized-bed furnace. 4,478,572, Cl. 432-13.000.

Seng, Stephen: *See*—
Hohman, Charles M.; Propster, Mark A.; Dunn, Charles; and Seng, Stephen, 4,478,627, Cl. 65-27.000.

Sergienko, Vladimir Y.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakvaev, Alexandr D.; and Vopilov, Alexandr N., 4,478,633, Cl. 71-37.000.

Sergovic, John A.: *See*—
Russell, Alexander H.; McClinton, John L.; and Sergovic, John A., 4,478,779, Cl. 264-319.000.

Sewerinson, Ake N., to AEL Microtel, Limited. Two pilot frequency control for communication systems. 4,479,256, Cl. 455-265.000.

Sfredda, Albert P. Automatic transmission. 4,478,100, Cl. 74-206.000.

Shaban, Atef M.: *See*—
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., 4,479,020, Cl. 568-850.000.

Shaffer, Dale A.; Kay, John W.; and Basquin, Maurice H., to Harmeson Manufacturing Co., Inc. Encapsulated basketball backboard. 4,478,415, Cl. 273-1.50R.

Shaffer, Mary E.: *See*—
Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., 4,478,888, Cl. 427-220.000.

Shakespeare Company: *See*—
Ballard, Larry, 4,478,971, Cl. 524-376.000.

Shamsid-Deen, John T. Holder for game pieces. 4,478,417, Cl. 273-150.000.

Sharp Kabushiki Kaisha: *See*—
Ikemoto, Yutaka; and Tsuda, Hiroshi, 4,478,523, Cl. 368-63.000.
Nakagawa, Kenichi; Minezaki, Shigehiro; and Funada, Fumiaki, 4,478,741, Cl. 252-299.630.
Ohba, Toshihiro; Kawaguchi, Masashi; Kinoshita, Hiroshi; Kanatani, Yoshiharu; and Uede, Hisashi, 4,479,120, Cl. 340-781.000.
Watanabe, Takashi; and Miyatake, Shigehiro, 4,479,143, Cl. 358-44.000.

Shaw, David N.; and Bulkley, Clifford T., to Dunham-Bush, Inc. Helical screw rotary compressor for air conditioning system having improved oil management. 4,478,054, Cl. 62-323.400.

Sheck, Wah; Beasley, Daniel T.; and Myles, Walter E., to Crosfield Data Systems, Inc. Method and apparatus for insuring that the transport of a scanning system is contiguous with its support. 4,479,148, Cl. 358-290.000.

Sheehan, Terrence M.: *See*—
Brown, Ivan R.; and Sheehan, Terrence M., 4,478,117, Cl. 82-32.000.

Sheill, David D., to Rockwell International Corporation. Slack adjuster for a disc brake. 4,478,317, Cl. 188-71.900.

Shekleton, Jack, to Solar Turbines Incorporated. Combustors and gas turbine engines employing same. 4,478,045, Cl. 60-737.000.

Shell, John W.; and Gale, Robert M., to Alza Corporation. Ocular preparation housing steroid in two different therapeutic forms. 4,478,818, Cl. 424-14.000.

Shell Oil Company: *See*—
Bekooij, Jurrianus; Raudenbusch, Werner T.; Stachowiak, Stephen A.; Kooijmans, Petrus G.; and Scholten, Henricus P. H., 4,478,985, Cl. 525-530.000.
Diaz, Zaida; and Miller, James H., 4,478,612, Cl. 55-29.000.
Goodall, Brian L.; and van der Linden-Lemmers, Wilhelmina J. M., 4,478,989, Cl. 526-142.000.

Shepard, Steve A.: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,479,197, Cl. 364-900.000.

Sherman, Benjamin F., Jr. Three-dimensional sliding element puzzle. 4,478,418, Cl. 273-153.00S.

Sherrod, Donnell. Method and apparatus for proportioning of fuel usage by a fluid fueled apparatus. 4,478,246, Cl. 137-557.000.

Sherwood Medical Company: *See*—
Mezei, Louis M.; Chen, Jung S.; Huang, John J.; and Lovins, Robert E., 4,478,744, Cl. 260-112.50R.

Shiba, Keisuke; Nakao, Sho; and Koizumi, Shigeo, to Fuji Photo Film Co., Ltd. Presensitized lithographic printing plates. 4,478,930, Cl. 430-271.000.

Shibata, Akira: *See*—
Takai, Hiromitsu; and Shibata, Akira, 4,479,190, Cl. 364-556.000.

Shibata, Kiyoshi: *See*—
Miyoshi, Yoshitake; Shibata, Kiyoshi; Watanabe, Toshio; Kai, Masami; and Ohata, Yousuke, 4,478,506, Cl. 355-3.0SH.

Shibuya, Kunihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for feeding sheets. 4,478,401, Cl. 271-22.000.

Shigematsu, Takashi: *See*—
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.

Shikada, Tsutomu: *See*—
Tominaga, Hiroo; Fujimoto, Kaoru; and Shikada, Tsutomu, 4,478,801, Cl. 423-235.000.

Shimada, Tamotsu; Kumada, Akio; Tokinaga, Daizo; Shinbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, to Hitachi, Ltd. Laser surgical apparatus. 4,478,217, Cl. 128-303.100.

Shimadzu Corporation: *See*—
Saito, Hidefumi; Hayashi, Munehiro; Mitani, Hisashi; Isaka, Hiromu; and Andoh, Masanao, 4,478,046, Cl. 62-6.000.

Shimase, Akira: *See*—
Tamura, Hifumi; Ishitani, Tohru; and Shimase, Akira, 4,479,060, Cl. 250-398.000.

Shimizu, Akihiko: *See*—
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,479,044, Cl. 219-69.00W.

Shimizu, Keiichi, to Kokusan Kinzoku Kogyo Kabushiki Kaisha. Door handle assembly. 4,478,445, Cl. 292-336.300.

Shimizu, Yutaka; Imura, Junichi; and Henmi, Shoichi, to Alps Electric Co., Ltd. Rotary electric component. 4,479,106, Cl. 338-160.000.

Shimotsuma, Wataru: *See*—
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,478,753, Cl. 260-396.00N.

Shinbo, Chiaki: *See*—
Shimada, Tamotsu; Kumada, Akio; Tokinaga, Daizo; Shinbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,478,217, Cl. 128-303.100.

Shinmoto, Jitsumi, to Tomi Machinery Manufacturing Co., Ltd. Air ring for inflation film molding. 4,478,564, Cl. 425-72.00R.

Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, to Teikoku Chemical Industry Co., Ltd. Complex compounds. 4,478,995, Cl. 536-46.000.

Shinoda, Yoshio; and Kuno, Akira, to Nippon Soken, Inc. Speed control system and method for automotive vehicles. 4,478,184, Cl. 123-352.000.

Shionogi & Co., Ltd.: *See*—
Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,478,997, Cl. 544-71.000.

Shioyama, Tod K., to Phillips Petroleum Company. Amination process. 4,479,009, Cl. 564-447.000.

Shiozawa, Etuo; Ohnishi, Masahiro; and Harada, Shigeo, to Fuji Photo Film Co., Ltd. Light beam rotary printer. 4,479,133, Cl. 346-108.000.

Shirogami, Tamotsu: *See*—
Ueno, Mitsushi; Maoka, Tadanori; Murata, Kenji; and Shirogami, Tamotsu, 4,478,918, Cl. 429-38.000.

Shiroyama, Masaharu: *See*—
Sakaguchi, Shigeya; Shiroyama, Masaharu; and Ito, Hiroshi, 4,478,871, Cl. 427-34.000.

Shobert, Alan L.: *See*—
Fickes, Michael G.; and Shobert, Alan L., 4,478,931, Cl. 430-309.000.

Shoji, Masakazu: *See*—
Krambeck, Robert H.; and Shoji, Masakazu, 4,479,216, Cl. 371-61.000.

Showa Denko K.K.: *See*—
Adachi, Takeshi; Takeshita, Tetsuo; and Matsuda, Itsuaki, 4,478,680, Cl. 162-103.000.

Showa Denko Kabushiki Kaisha: *See*—
Mayumi, Yoshishige; Satoh, Kenzoh; Hasegawa, Kenji; and Takahashi, Mitsuyoshi, 4,478,899, Cl. 428-72.000.

Showa Tool Co., Ltd.: *See*—
Kakino, Yoshiaki, 4,478,538, Cl. 408-6.000.

Shrefler, Kenneth D. Marking device for fire hydrant or the like. 4,478,169, Cl. 116-209.000.

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Shu, Peter H.: *See—*
Abolins, Visvaldis; Axelrod, Robert J.; and Shu, Peter H., 4,478,970, Cl. 524-125.000.

Siegel, Jeffry A.: *See—*
Lee, Wai-Nang P.; Harpen, Michael D.; and Siegel, Jeffry A., 4,478,945, Cl. 436-500.000.

Siegel, Leon S., to Combustion Engineering, Inc. Control for an electrostatic treater. 4,479,164, Cl. 361-235.000.

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Hoppe, Hans; Bercx, Helmut; and Siegel, Wolfgang, 4,478,517, Cl. 366-101.000.

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Brunner, Anton; and Rieskamp, Klaus, 4,479,128, Cl. 343-756.000.
Fenk, Josef, 4,479,259, Cl. 455-318.000.
Haendle, Joerg; and Maass, Wolfgang, 4,479,231, Cl. 378-99.000.
Hassler, Dieter; and Trautenberg, Elmar, 4,478,083, Cl. 73-620.000.
Hassler, Dieter; and Trautenberg, Elmar, 4,478,084, Cl. 73-620.000.
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Neuwald, Anselm, 4,478,878, Cl. 427-79.000.
Pachonik, Horst; and Seebacher, Gerhard, 4,478,875, Cl. 427-41.000.
Rosenfeldt, Bernd; Weller, Gerhard; Wondra, Arthur; and Reis, Edmund, 4,479,263, Cl. 455-602.000.

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Checinski, Stanley S., 4,479,101, Cl. 335-37.000.

Sieradski, Leonard M. Solar heating system. 4,478,210, Cl. 126-418.000.

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Rhines, David W., 4,479,239, Cl. 381-72.000.

Silverman, Daniel. Method of monitoring the spacial production of hydrocarbons from a petroleum reservoir. 4,479,204, Cl. 367-47.000.

Simpson, John S. A.: *See—*
Campbell, Anthony K.; Simpson, John S. A.; and Woodhead, James S., 4,478,817, Cl. 424-7.100.

Singer Company, The: *See—*
Dicke, William C., 4,478,010, Cl. 51-170.0TL.
Hicks, Irwin A.; and Schneider, George W., Jr., 4,478,078, Cl. 73-253.000.
Hicks, Irwin A.; and Kee, David F., 4,478,079, Cl. 73-253.000.

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Sink, William H., to Dana Corporation. Resilient drive means for a clutch. 4,478,324, Cl. 192-70.170.

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Siwula, John T. Torsion type exercise device. 4,478,413, Cl. 272-134.000.

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Weinberg, Norman L., 4,478,694, Cl. 204-77.000.

Skahill, George. Directive antenna system employing a paraboloidal main dish and ellipsoidal subdish. 4,479,129, Cl. 343-781.00P.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,478,066, Cl. 72-358.000.

Skinner, David R.; Stokes, Rex A.; Freeman, Lewis O.; and McNeill, Alan R., to Commonwealth of Australia. Optical system for a spectrophotometer. 4,478,513, Cl. 356-323.000.

Skinner, William O., to Press/Seal Gasket Corp. Radially expandable locking sleeve device. 4,478,437, Cl. 285-189.000.

Slater, Glenn L.; Weiler, Gerhard H.; Turoff, Robert; and Kitterman, Lawrence, to Baxter Travenol Laboratories, Inc., by said Slater, Turoff and Kitterman. Sterilizable container with inner closure and collapse-resistant cover. 4,478,342, Cl. 215-32.000.

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Smiley, Raymond E. Door hinging assembly for sliding glass door structure. 4,478,267, Cl. 160-97.000.

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Caspari, Frederick W.; Smith, Bruce E.; and Heuer, Daniel A., 4,479,248, Cl. 455-183.000.

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Ainsworth, Anthony T.; and Smith, David G., 4,478,849, Cl. 424-285.000.

Smith, Derek J.: *See—*
Page, Ronald C.; and Smith, Derek J., 4,478,104, Cl. 74-479.000.

Smith, Dewey H., Jr., to Du Pont de Nemours, E. I., and Company. Appetite suppressing compositions and methods. 4,478,840, Cl. 424-260.000.

Smith, Edgar C.; and Campbell, James B., to Three Dimensional Photography Corporation. Method for stereoscopic photography. 4,478,639, Cl. 430-9.000.

Smith, Michael B.: *See—*
Nolte, Kenneth G.; and Smith, Michael B., 4,478,282, Cl. 166-281.000.

Smith, Murray S., Jr.; Perkins, Roger J.; Fryxell, Robert E.; and Young, William R., to General Electric Company. Homogenous alloy powder. 4,478,638, Cl. 75-255.000.

Smith, Robert L.: *See—*
Raba, Carl F., Jr.; Smith, Robert L.; and Huang, Francis Y., 4,478,736, Cl. 252-180.000.

Smith, Robert W., to Eneroil Research Ltd. Condensing furnaces. 4,478,158, Cl. 110-215.000.

Smith, Waldo: *See—*
Dickens, David R.; Smith, Waldo; and Malin, Herbert, 4,478,901, Cl. 428-120.000.

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Bryan, William M., 4,478,984, Cl. 525-333.600.

Smucker, Alvin J. M.; McBurney, Shawn L.; and Srivastava, Ajit K., to Board of Trustees Operating Michigan State University. Separation method and apparatus. 4,478,710, Cl. 209-17.000.

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Hopkins, Daniel N.; and Snavely, Earl S., 4,478,280, Cl. 166-260.000.

Snowden, Roger L.: *See—*
Schulte-Elte, Karl H.; Snowden, Roger L.; and Muller, Bernard L., 4,479,011, Cl. 568-361.000.

Snyder, Richard D. Broadband antennae employing coaxial transmission line sections. 4,479,130, Cl. 343-802.000.

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Sarfati, Alberto G.; Bianchi, Massimiliano; and Riva, Merate, 4,478,375, Cl. 242-47.010.

Societe Alsacienne de Construction de Materiel Textile: *See—*
Juillard, Yves, 4,478,255, Cl. 139-21.000.
Juillard, Yves, 4,478,257, Cl. 139-110.000.

Societe Alsacienne De Constructions Mecanniques De Mulhouse: *See—*
Beaudoux, Michel; and Vuillet, Jean-Pierre, 4,478,254, Cl. 139-1.00E.

Societe Comatel S.A.: *See—*
Cabaud, Aime , 4,477,969, Cl. 29-739.000.

Societe Nationale de Liamiante: *See—*
Lalancette, Jean M.; and Drolet, Jean P., 4,478,796, Cl. 423-155.000.

Societe Nationale Elf Aquitaine: *See—*
Lecacheux, Didier; Lesec, James; and Prechner, Roland, 4,478,071, Cl. 073-55.000.
Perrut, Michel, 4,478,720, Cl. 210-659.000.

Socla, S.A.: *See—*
Neuzeret, Bernard; Richard, Jean; and Comeau, Jean-Francois, 4,478,236, Cl. 137-107.000.

Solar Turbines Incorporated: *See—*
Shekleton, Jack, 4,478,045, Cl. 60-737.000.

Solex Research Corporation: *See—*
Watanabe, Morio; and Nishimura, Sanji, 4,478,804, Cl. 423-259.000.

Solhjell, Erik: *See—*
Lia, Herman; and Solhjell, Erik, 4,479,151, Cl. 360-46.000.

Solid State Devices, Inc.: *See—*
Bartur, Meir; and Nicolet, Marc, 4,478,881, Cl. 427-90.000.

Sommer, Horst; and Gronle, Hansgeorg, to Elring Dichtungswerke GmbH. Reinforced support sheet and method for making same. 4,478,887, Cl. 427-211.000.

Sone, Takeo: *See—*
Okada, Minoru; Sone, Takeo; Sakamoto, Shigeru; Koizumi, Yuji; and Tsuda, Iwao, 4,478,541, Cl. 409-232.000.

Sonoda, Nobuo: *See—*
Hotta, Shu; Hosaka, Tomiharu; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,478,753, Cl. 260-396.00N.

Sony Corporation: *See—*
Yamazaki, Shigeru; and Takano, Yoshiaki, 4,479,144, Cl. 358-60.000.
Yokoya, Satoshi; and Numata, Norio, 4,479,234, Cl. 381-15.000.

Sorce, Peter S.: *See—*
Clifford, Earl W.; Perhach, John M.; and Sorce, Peter S., 4,478,070, Cl. 73-49.300.

Soref, Richard A., to Sperry Corporation. Optical bypass switch. 4,478,494, Cl. 350-381.000.

Sorensen, George C. Boat. 4,478,166, Cl. 114-290.000.

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Buchanan, Charles W., 4,477,990, Cl. 40-155.000.

Souchay, Philippe; and Glorie, Maurice, to Thomson-CSF. Device for reduction of the false alarm ratio and monitor receiver comprising such a device of this nature. 4,479,252, Cl. 455-223.000.

Souillard, Gerald: *See—*
Pittion, Philippe; Andre, Guy; Souillard, Gerald; J'espere, Jean-Louis; and Houte, Bernard, 4,478,381, Cl. 248-71.000.

Soula, Gerard, to Rhone-Poulenc Specialites Chimiques. Isomerization of bromohalogenobenzenes. 4,479,022, Cl. 570-202.000.

Souriau & Cie (SA): *See—*
Obeissart, Albert, 4,478,487, Cl. 350-96.210.

South African Inventions Development Corporation: *See—*
Van der Merwe, Kirsten J.; and Polson, Alfred, 4,478,946, Cl. 436-518.000.

Southco, Inc.: *See—*
Ellis, Thomas J., 4,478,115, Cl. 81-436.000.

Southwire Company: *See—*
Duke, John C., 4,478,063, Cl. 72-42.000.

Sowards, Gregory E. Soccer training and practice device. 4,478,420, Cl. 273-411.000.

Spector, Abner. Audio effects system and method. 4,479,238, Cl. 381-61.000.

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Bradley, Martin P. T.; Miller, Leslie A.; McCall, Thomas J.; and Middlebusher, Duane L., 4,478,095, Cl. 73-864.210.

Spellman, Cedric P.: *See—*
O'Connor, Robert J., 4,478,730, Cl. 252-34.700.

Sperry Corporation: *See*—
Chi, Chao S., 4,479,152, Cl. 360-46.000.
De Coene, Frans J. G. C.; and Naaktgeboren, Adrianus, 4,478,027, Cl. 56-16.400.
Frische, Richard H.; Dankwort, Rudolf C.; and Klem, Charles D., 4,479,070, Cl. 310-338.000.
Soref, Richard A., 4,478,494, Cl. 350-381.000.

Sperry, John A.; and Maguire, Dennis D., to Autotype International Limited. Photopolymer derivatives of polyvinyl alcohol. 4,478,977, Cl. 525-61.000.

Spong, Gary W., to Pannutti, Antonio Valentino, a part interest. Ice-holding and game-adaptable insert cup for drinking container. 4,478,346, Cl. 220-90.200.

Sprague Electric Company: *See*—
Finkelstein, Manuel; Dunkl, Franz C.; and Ross, Sidney D., 4,479,166, Cl. 361-433.000.
Green, Gilbert E., Jr., 4,479,168, Cl. 361-433.000.
Ross, Sidney D.; and Finkelstein, Manuel, 4,479,167, Cl. 361-433.000.

Sprague, Robert A., to Xerox Corporation. Variable length electro-optic waveguides and applications therefor. 4,478,483, Cl. 350-96.140.

SPS Technologies, Inc.: *See*—
Clark, Leonard R.; and Meehl, David W., 4,478,466, Cl. 312-215.000.

Square D Company: *See*—
Marien, Kenneth J.; and Lemke, Winfred R., 4,479,102, Cl. 335-132.000.

Srivastava, Ajit K.: *See*—
Smucker, Alvin J. M.; McBurney, Shawn L.; and Srivastava, Ajit K., 4,478,710, Cl. 209-17.000.

Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie): *See*—
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Stacey, Eric J., to Westinghouse Electric Corp. Band-pass sequence filters for symmetrical components of multiphase AC power systems. 4,479,160, Cl. 361-76.000.

Stachowiak, Stephen A.: *See*—
Bekooij, Jurrianus; Raudenbusch, Werner T.; Stachowiak, Stephen A.; Kooijmans, Petrus G.; and Scholten, Henricus P. H., 4,478,985, Cl. 525-530.000.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; and Stockhaus, Klaus, to Boehringer Ingelheim KG. Bradycardiac or analgesic 2-(N-(thienyl-2-methyl)-N-(2-fluoro-6-methyl-phenyl)-amino)-2-imidazoline and salts thereof. 4,478,844, Cl. 424-273.00R.

Standard Oil Company, The: *See*—
Mark, Seymour, 4,478,603, Cl. 44-51.000.
Nolte, Kenneth G.; and Smith, Michael B., 4,478,282, Cl. 166-281.000.
Pesa, Frederick A.; and Graham, Anne M., 4,478,955, Cl. 518-713.000.

Standard Oil Company (Indiana): *See*—
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., 4,478,954, Cl. 518-700.000.
Hunt, Mack W.; and West, Charles T., 4,478,729, Cl. 252-33.200.
Nebe, Juergen; and Ladeur, Bernhard H., 4,478,900, Cl. 428-92.000.

Standard Products Company, The: *See*—
Jackson, Norman C., 4,478,020, Cl. 52-309.130.

Stanley Aviation Corporation: *See*—
Arnold, Jack A., 4,478,439, Cl. 285-340.000.

Starck, James W.: *See*—
Maijer, Rolf; and Starck, James W., 4,478,576, Cl. 433-3.000.

Statomat-Globe Maschinenfabrik GmbH: *See*—
Napierski, Reinhard, 4,477,966, Cl. 29-596.000.

Stauffer Chemical Company: *See*—
Hyzak, Daniel L., 4,478,636, Cl. 71-100.000.

Stauss, Kirk B., to Global Nutrameal, Inc. Process of making shelf stable, nutrient fortified cereal based food. 4,478,857, Cl. 426-72.000.

Stecklein, Gary L., to Deere & Company. Spill sheet structure on loader bucket. 4,477,987, Cl. 37-118.00R.

Steelcase Inc.: *See*—
Faiks, Frederick S., 4,478,454, Cl. 297-316.000.

Steele, Raymond: *See*—
Prabhu, Vasant K.; and Steele, Raymond, 4,479,226, Cl. 375-1.000.

Steinberger, Helmut: *See*—
Schonfelder, Manfred; Haas, Peter; Avar, Geza; and Steinberger, Helmut, 4,478,893, Cl. 427-387.000.

Steiner, Edward: *See*—
Daughton, John W.; Gray, Gary A.; Wilczek, Stephen A.; and Steiner, Edward, 4,478,509, Cl. 355-14.00C.

Stelly, Curtis; and Arnaud, Elmer J. Foldable loading ramp for all terrain/recreational vehicles and the like. 4,478,549, Cl. 414-537.000.

Stemmler, Bruno: *See*—
Zeilinger, Hans; Muhlratzer, August; and Stemmler, Bruno, 4,478,648, Cl. 148-6.300.

Stenger, Antoine: *See*—
Mouzin, Gilbert; Cousse, Henri; Bonnaud, Bernard; Morre, Michel; and Stenger, Antoine, 4,478,836, Cl. 424-248.540.

Stephens, Leonard. Coal briquette and method. 4,478,601, Cl. 44-14.000.

Stewart, Daniel B.: *See*—
Madsen, Craig C.; Stewart, Daniel B.; and Andree, James, 4,479,111, Cl. 340-365.00P.

Stewart, David G.: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,478,806, Cl. 423-328.000.

Stewart, Robert C., Jr.: *See*—
Maricle, Donald L.; Putnam, Gary C.; and Stewart, Robert C., Jr., 4,478,776, Cl. 264-83.000.

Stewart, William H.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., 4,479,034, Cl. 179-18.0ES.

Stobb, Inc.: *See*—
Stobb, Walter J., 4,478,398, Cl. 270-53.000.

Stobb, Walter J., to Stobb, Inc. System for routing a signature for stitching using a lift finger. 4,478,398, Cl. 270-53.000.

Stockhaus, Klaus: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; and Stockhaus, Klaus, 4,478,844, Cl. 424-273.00R.

Stokes, Rex A.: *See*—
Skinner, David R.; Stokes, Rex A.; Freeman, Lewis O.; and McNeill, Alan R., 4,478,513, Cl. 356-323.000.

Stone Construction Equipment, Inc.: *See*—
Tobin, Robert A., 4,478,515, Cl. 366-67.000.

Stopper, Herbert, to Burroughs Corporation. Wafer including test lead connected to ground for testing networks thereon. 4,479,088, Cl. 324-73.00R.

Storage Technology Partners: *See*—
Chang, Jenq-Sian; and Chang, Yih-Jau, 4,478,679, Cl. 156-653.000.

Storr, Helmut: *See*—
Kochndorfer, Michael; Kurtz, Rudiger; Meurer, Werner; Seider, Werner; and Storr, Helmut, 4,478,684, Cl. 162-337.000.

Strain, Patrick J. Ballast-cargo grid system for tankers. 4,478,165, Cl. 114-74.00R.

Strand, Norman S., to Microdot Inc. Composite rivet. 4,478,544, Cl. 411-34.000.

Strata Bit Corporation: *See*—
Radtke, Robert P., 4,478,297, Cl. 175-329.000.

Strinning, Olof B. S.: *See*—
Dahlen, Anne-Marie; and Strinning, Olof B. S., 4,478,855, Cl. 426-41.000.

Strohmeyer, Max: *See*—
Fischer, Karl; Grenacher, Armin V.; Herr, Manfred; and Strohmeyer, Max, 4,479,012, Cl. 568-454.000.

Stromberg-Carlson Corp.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., 4,479,034, Cl. 179-18.0ES.

Sturm, Karl; Muschaweck, Roman; and Hropot, Max, to Hoechst Aktiengesellschaft. 5-Phenyltetrazoles and their use as salidiuretics. 4,478,843, Cl. 424-269.000.

Suburban Duplicator Repair, Inc.: *See*—
Commers, Louis P., 4,478,400, Cl. 271-3.100.

Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., to Lummus Company, The. Production of halohydrins. 4,479,020, Cl. 568-850.000.

Sugasawa, Fukashi, to Nissan Motor Company, Limited. Automatic sound level control system for audio equipment. 4,479,237, Cl. 381-57.000.

Sugimoto, Tadahiro, to Daito Seiki Company Limited. Metal-sawing machine. 4,478,120, Cl. 83-71.000.

Sugo, Yasuhisa: *See*—
Sato, Masashi; and Sugo, Yasuhisa, 4,479,200, Cl. 365-175.000.

Sulcek, Charles E., to Whirlpool Corporation. Compactor door with literature storage compartment. 4,478,465, Cl. 312-183.000.

Sullivan, James D., to Vanner, Inc. DC Power system having battery voltage equalizer circuit. 4,479,083, Cl. 320-6.000.

Sumitomo Electric Industries, Inc.: *See*—
Akai, Shin-ichi, 4,478,675, Cl. 156-605.000.
Ishise, Kojiro; and Kojima, Keiichi, 4,479,031, Cl. 174-73.00R.

Sumner, Cyril R., to Halliburton Company. Positive fire indicator system. 4,478,294, Cl. 175-4.560.

Sun Electric Corporation: *See*—
Karpowycz, Ihor B., 4,479,057, Cl. 250-343.000.

Sun Tech, Inc.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,478,752, Cl. 260-396.00R.

Sunbeam Corporation: *See*—
Khaja, Farees U.; Ernest, Robert O.; Gronwick, Jerry P.; and Bristol, Howard A., 4,479,047, Cl. 219-225.000.

Sundstrand Corporation: *See*—
Brenner, Kenneth I.; and Wollschlager, Joseph F., 4,478,130, Cl. 91-6.500.
Pollman, Frederic W., 4,478,041, Cl. 60-444.000.

Sunk, James E.: *See*—
Nadkarni, Anil V.; Samal, Prasanna K.; Wang, James C.; and Sunk, James E., 4,478,787, Cl. 419-8.000.

Sunstar Giken Kabushiki Kaisha: *See*—
Kohno, Kiyoshi; Nishikawa, Satoshi; Hattori, Yoshiya; and Kitao, Kohji, 4,478,990, Cl. 526-279.000.

Super Sack Manufacturing Corporation: *See*—
Derby, Norwin C.; and Williamson, Robert R., 4,479,243, Cl. 383-24.000.

Surdi, Jean M., to S.N.E.C.M.A. Fan blade axial and radial retention device. 4,478,554, Cl. 416-221.000.

Suwahara, Hirosi: *See*—
Ii, Akira; Morikawa, Toshio; and Suwahara, Hirosi, 4,478,764, Cl. 261-50.00A.

Suzuki, Hiroaki: *See*—
Misono, Shinji; and Suzuki, Hiroaki, 4,478,973, Cl. 524-496.000.

Suzuki, Koji: *See*—
Kawasaki, Masahiro; Aoki, Harumi; and Suzuki, Koji, 4,479,062, Cl. 250-578.000.
Suzuki, Shigehisa: *See*—
Kumagai, Munehito; and Suzuki, Shigehisa, 4,479,156, Cl. 360-104.000.
Suzuki, Shinichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Avalanche photo-diode bias circuit. 4,479,052, Cl. 250-214.00R.
Suzuki, Sigeru, to Kuroda Precision Industries Ltd. Contact sensor. 4,477,976, Cl. 33-169.00R.
Svensson, Sten-Eric; and Andersson, Gustaf A., to Frigoscandia Contracting AB. Apparatus for heat treatment. 4,478,141, Cl. 99-476.000.
Sweeney, Paula C.: *See*—
Hopkins, William J.; Sweeney, Paula C.; and Bailey, David G., 4,478,728, Cl. 252-8.570.
Swenson, Donald A.: *See*—
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,479,218, Cl. 372-2.000.
Sydansk, Robert D., to Marathon Oil Company. Process for improving waterflood performance in heterogeneous clay-sensitive formations. 4,478,283, Cl. 166-292.000.
Synthelabo: *See*—
Kaplan, Jean-Pierre; and Raizon, Bernard, 4,478,851, Cl. 424-330.000.
Szell nee Hasenohrl, Erzsebet: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; and Bagdy, Daniel, 4,478,745, Cl. 260-112.50R.
Tabata, Junichi, to Seiko Instruments & Electronics Ltd. Electrochromic display device having constant color density and driving method therefor. 4,479,121, Cl. 340-785.000.
Taboola Pty. Limited: *See*—
Preddey, Brian F., 4,478,061, Cl. 70-358.000.
Tachikawa Spring Co., Ltd.: *See*—
Urai, Muneharu, 4,478,383, Cl. 248-429.000.
Tagami, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Radiator mounting mechanism. 4,478,306, Cl. 180-229.000.
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, to Nippon Soken, Inc. Safety seatbelt retractor. 4,478,433, Cl. 280-807.000.
Taguchi, Mitsuo: *See*—
Miyoshi, Tadahiko; Yoshikawa, Masanori; and Taguchi, Mitsuo, 4,478,704, Cl. 204-412.000.
Takada, Toshiyuki: *See*—
Fujikawa, Tetsuzo; and Takada, Toshiyuki, 4,478,180, Cl. 123-59.0BS.
Takagi, Norio; and Aoyagi, Hiroshi, to Teijin Limited. Process for preparing cast film of thermoplastic resin. 4,478,772, Cl. 264-22.000.
Takahashi, Mitsuyoshi: *See*—
Mayumi, Yoshishige; Satoh, Kenzoh; Hasegawa, Kenji; and Takahashi, Mitsuyoshi, 4,478,899, Cl. 428-72.000.
Takai, Hiromitsu; and Shibata, Akira, to Nippondenso Co., Ltd. Detecting apparatus using a digital computer. 4,479,190, Cl. 364-556.000.
Takai, Kazuki; Okada, Hitoshi; and Yamaguchi, Katsumi. Auto-loading mechanism in a magnetic recording/reproducing apparatus. 4,479,155, Cl. 360-96.500.
Takai, Kiyoshi: *See*—
Okuno, Ryuzo; Toyoda, Keio; Sarai, Masahiro; and Takai, Kiyoshi, 4,478,574, Cl. 432-180.000.
Takai, Toru; Takei, Kenji; and Nagano, Youichi, to Nippon Seiko Kabushiki Kaisha. Conical roller bearing. 4,478,463, Cl. 384-482.000.
Takano, Yoshiaki: *See*—
Yamazaki, Shigeru; and Takano, Yoshiaki, 4,479,144, Cl. 358-60.000.
Takao, Mitsunori; and Mizuno, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling an internal combustion engine. 4,479,186, Cl. 364-431.050.
Takara Co., Ltd.: *See*—
Wakase, Hiroshi, 4,478,313, Cl. 185-39.000.
Takatsuji, Masamoto: *See*—
Shimada, Tamotsu; Kumada, Akio; Tokinaga, Daizo; Shinbo, Chiaki; Horiuchi, Hideyuki; and Takatsuji, Masamoto, 4,478,217, Cl. 128-303.100.
Takeda Chemical Industries, Inc.: *See*—
Tanaka, Michio; Kamatani, Yoshio; and Nasu, Koji, 4,478,894, Cl. 427-388.200.
Takehara, Masahiro: *See*—
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Takei, Kenji: *See*—
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Takenaka, Shigeo; and Kamohara, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of shadow mask manufacture. 4,478,589, Cl. 445-37.000.
Takeoka, Yoshikatsu; and Yasuda, Nobuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing optical type recording medium. 4,478,768, Cl. 264-1.400.
Takeshita, Tetsuo: *See*—
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Tamai, Yasuo: *See*—
Mizuno, Chiaki; and Tamai, Yasuo, 4,478,908, Cl. 428-327.000.
Tamura, Hifumi; Ishitani, Tohru; and Shimase, Akira, to Hitachi, Ltd. Apparatus for irradiation with charged particle beams. 4,479,060, Cl. 250-398.000.
Tamura, Kohki: *See*—
Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, 4,478,917, Cl. 429-33.000.
Tamura, Tadashi, to Carl Freudenberg, Firma. Air filter. 4,478,620, Cl. 55-486.000.
Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Electrostatic recording apparatus. 4,478,504, Cl. 355-1.000.
Tanaka, Hideo: *See*—
Yazaki, Mitsuyoshi; Tanaka, Hideo; and Nakamura, Masayoshi, 4,478,735, Cl. 252-135.000.
Tanaka, Hisashi: *See*—
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Tanaka, Masakazu; and Murayama, Ken, to Toyo Boseki Kabushika Kaisha. Polyvinyl chloride composition. 4,478,961, Cl. 523-105.000.
Tanaka, Michio; Kamatani, Yoshio; and Nasu, Koji, to Takeda Chemical Industries, Inc. One-pack type thermosetting polyurethane coating composition. 4,478,894, Cl. 427-388.200.
Tanaka, Yoshikazu: *See*—
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,478,105, Cl. 74-730.000.
Tanaka, Yoshio, to Clarion Co., Ltd. Pushbutton tuner. 4,478,097, Cl. 74-10.330.
Tanaka, Yoshio: *See*—
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Lia, Herman; and Solhjell, Erik, 4,479,151, Cl. 360-46.000.
Taniguchi, Takashi; and Mibae, Jiro, to Toray Industries, Inc. Anti-fogging coating film. 4,478,909, Cl. 428-331.000.
Tanikawa, Isao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, 4,478,889, Cl. 427-230.000.
Tanner, William D. Air pilot valve controller. 4,478,240, Cl. 137-315.000.
Tanouchi, Masatoshi; and Akiyama, Hirshumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Adsorptive separation method. 4,478,723, Cl. 210-674.000.
Taschner, Heinz: *See*—
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Tashiro, Tsuneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing apparatus for improved charging of flying toner. 4,478,505, Cl. 355-3.0DD.
Taub, Alan I.: *See*—
Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., 4,478,791, Cl. 420-590.000.
Tavano, John B. Sloped glazing structure. 4,478,013, Cl. 52-92.000.
Taylor, Thomas A.: *See*—
Walker, Lewis; and Taylor, Thomas A., 4,478,207, Cl. 126-101.000.
Tchoukran, Israel: *See*—
Vofsi, David; Reich, Shymon; Tchoukran, Israel; and Mayoral, Joaquin, 4,478,770, Cl. 264-2.100.
Teijin Limited: *See*—
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Teikoku Chemical Industry Co., Ltd.: *See*—
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Teissedre, Robert: *See*—
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Tekcast Associates, Inc.: *See*—
Schaer, Leonard S., 4,478,567, Cl. 425-150.000.
Teknor Apex Company: *See*—
Dickens, David R.; Smith, Waldo; and Malin, Herbert, 4,478,901, Cl. 428-120.000.
Teramachi, Hiroshi. Linear ball bearing unit. 4,478,462, Cl. 308-6.00C.
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Terry, Michael B.: *See*—
Larson, David N.; Ireland, Jeffrey; and Terry, Michael B., 4,479,097, Cl. 331-111.000.
Tessier, Jean; Demoute, Jean-Pierre; and Bonin, Werner, to Roussel Uclaf. Ester. 4,478,850, Cl. 424-304.000.
Tessitore, Pietro T. 2-(1-Alkyl-5-nitro)-imidazolyl-1-(2-hydroxy-5-alkyl)-phenyl carbinols and pharmaceutical compositions containing them. 4,478,846, Cl. 424-273.00R.
Testa, Vincent M., Jr., to Vinal Realty Trust. Tool for use in stripping shingles. 4,477,972, Cl. 30-172.000.
Testut Aequitas: *See*—
Valadier, Jean-Claude, 4,478,093, Cl. 73-862.650.
Texaco Canada Resources Ltd.: *See*—
Klein, George D., 4,478,278, Cl. 166-105.000.
Texaco Inc.: *See*—
Cuscurida, Michael; and Krause, Walter P., 4,479,010, Cl. 564-477.000.

Sperry Corporation: *See*—
Chi, Chao S., 4,479,152, Cl. 360-46.000.
De Coene, Frans J. G. C.; and Naaktgeboren, Adrianus, 4,478,027, Cl. 56-16.400.
Frische, Richard H.; Dankwort, Rudolf C.; and Klem, Charles D., 4,479,070, Cl. 310-338.000.
Soref, Richard A., 4,478,494, Cl. 350-381.000.
Sperry, John A.; and Maguire, Dennis D., to Autotype International Limited. Photopolymer derivatives of polyvinyl alcohol. 4,478,977, Cl. 525-61.000.
Spong, Gary W., to Pannutti, Antonio Valentino, a part interest. Ice-holding and game-adaptable insert cup for drinking container. 4,478,346, Cl. 220-90.200.
Sprague Electric Company: *See*—
Finkelstein, Manuel; Dunkl, Franz C.; and Ross, Sidney D., 4,479,166, Cl. 361-433.000.
Green, Gilbert E., Jr., 4,479,168, Cl. 361-433.000.
Ross, Sidney D.; and Finkelstein, Manuel, 4,479,167, Cl. 361-433.000.
Sprague, Robert A., to Xerox Corporation. Variable length electro-optic waveguides and applications therefor. 4,478,483, Cl. 350-96.140.
SPS Technologies, Inc.: *See*—
Clark, Leonard R.; and Meehl, David W., 4,478,466, Cl. 312-215.000.
Square D Company: *See*—
Marien, Kenneth J.; and Lemke, Winfred R., 4,479,102, Cl. 335-132.000.
Srivastava, Ajit K.: *See*—
Smucker, Alvin J. M.; McBurney, Shawn L.; and Srivastava, Ajit K., 4,478,710, Cl. 209-17.000.
Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie): *See*—
de Keijzer, Johannes, 4,479,188, Cl. 364-484.000.
Stacey, Eric J., to Westinghouse Electric Corp. Band-pass sequence filters for symmetrical components of multiphase AC power systems. 4,479,160, Cl. 361-76.000.
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Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Kobinger, Walter; and Stockhaus, Klaus, to Boehringer Ingelheim KG. Bradycardiac or analgesic 2-(N-(thienyl-2-methyl)-N-(2-fluoro-6-methyl-phenyl)-amino)-2-imidazoline and salts thereof. 4,478,844, Cl. 424-273.00R.
Standard Oil Company, The: *See*—
Mark, Seymour, 4,478,603, Cl. 44-51.000.
Nolte, Kenneth G.; and Smith, Michael B., 4,478,282, Cl. 166-281.000.
Pesa, Frederick A.; and Graham, Anne M., 4,478,955, Cl. 518-713.000.
Standard Oil Company (Indiana): *See*—
Connolly, John F.; Wennerberg, Arnold N.; and Waters, Robert F., 4,478,954, Cl. 518-700.000.
Hunt, Mack W.; and West, Charles T., 4,478,729, Cl. 252-33.200.
Nebe, Juergen; and Ladeur, Bernhard H., 4,478,900, Cl. 428-92.000.
Standard Products Company, The: *See*—
Jackson, Norman C., 4,478,020, Cl. 52-309.130.
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Arnold, Jack A., 4,478,439, Cl. 285-340.000.
Starck, James W.: *See*—
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Statomat-Globe Maschinenfabrik GmbH: *See*—
Napierski, Reinhard, 4,477,966, Cl. 29-596.000.
Stauffer Chemical Company: *See*—
Hyzak, Daniel L., 4,478,636, Cl. 71-100.000.
Stauss, Kirk B., to Global Nutrameal, Inc. Process of making shelf stable, nutrient fortified cereal based food. 4,478,857, Cl. 426-72.000.
Steckklein, Gary L., to Deere & Company. Spill sheet structure on loader bucket. 4,477,987, Cl. 37-118.00R.
Steelcase Inc.: *See*—
Faiks, Frederick S., 4,478,454, Cl. 297-316.000.
Steele, Raymond: *See*—
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Steinberger, Helmut: *See*—
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Daughton, John W.; Gray, Gary A.; Wilczek, Stephen A.; and Steiner, Edward, 4,478,509, Cl. 355-14.00C.
Stelly, Curtis; and Arnaud, Elmer J. Foldable loading ramp for all terrain/recreational vehicles and the like. 4,478,549, Cl. 414-537.000.
Stemmler, Bruno: *See*—
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Stenger, Antoine: *See*—
Mouzin, Gilbert; Cousse, Henri; Bonnaud, Bernard; Morre, Michel; and Stenger, Antoine, 4,478,836, Cl. 424-248.540.
Stephens, Leonard. Coal briquette and method. 4,478,601, Cl. 44-14.000.
Stewart, Daniel B.: *See*—
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Stewart, David G.: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,478,806, Cl. 423-328.000.
Stewart, Robert C., Jr.: *See*—
Maricle, Donald L.; Putnam, Gary C.; and Stewart, Robert C., Jr., 4,478,776, Cl. 264-83.000.
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Stobb, Inc.: *See*—
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Stobb, Walter J., to Stobb, Inc. System for routing a signature for stitching using a lift finger. 4,478,398, Cl. 270-53.000.
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Stokes, Rex A.: *See*—
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Stone Construction Equipment, Inc.: *See*—
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Storr, Helmut: *See*—
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Strain, Patrick J. Ballast-cargo grid system for tankers. 4,478,165, Cl. 114-74.00R.
Strand, Norman S., to Microdot Inc. Composite rivet. 4,478,544, Cl. 411-34.000.
Strata Bit Corporation: *See*—
Radtke, Robert P., 4,478,297, Cl. 175-329.000.
Strinning, Olof B. S.: *See*—
Dahlen, Anne-Marie; and Strinning, Olof B. S., 4,478,855, Cl. 426-41.000.
Strohmeyer, Max: *See*—
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Sturm, Karl; Muschaweck, Roman; and Hropot, Max, to Hoechst Aktiengesellschaft. 5-Phenyltetrazoles and their use as salidiuretics. 4,478,843, Cl. 424-269.000.
Suburban Duplicator Repair, Inc.: *See*—
Commers, Louis P., 4,478,400, Cl. 271-3.100.
Suciu, George D.; Kwon, Joon T.; and Shaban, Atef M., to Lummus Company, The. Production of halohydrins. 4,479,020, Cl. 568-850.000.
Sugasawa, Fukashi, to Nissan Motor Company, Limited. Automatic sound level control system for audio equipment. 4,479,237, Cl. 381-57.000.
Sugimoto, Tadahiro, to Daito Seiki Company Limited. Metal-sawing machine. 4,478,120, Cl. 83-71.000.
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Sulcek, Charles E., to Whirlpool Corporation. Compactor door with literature storage compartment. 4,478,465, Cl. 312-183.000.
Sullivan, James D., to Vanner, Inc. DC Power system having battery voltage equalizer circuit. 4,479,083, Cl. 320-6.000.
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Akai, Shin-ichi, 4,478,675, Cl. 156-605.000.
Ishise, Kojiro; and Kojima, Keiichi, 4,479,031, Cl. 174-73.00R.
Sumner, Cyril R., to Halliburton Company. Positive fire indicator system. 4,478,294, Cl. 175-4.560.
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Sun Tech, Inc.: *See*—
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Pollman, Frederic W., 4,478,041, Cl. 60-444.000.
Sunk, James E.: *See*—
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Sunstar Giken Kabushiki Kaisha: *See*—
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Super Sack Manufacturing Corporation: *See*—
Derby, Norwin C.; and Williamson, Robert R., 4,479,243, Cl. 383-24.000.
Surdi, Jean M., to S.N.E.C.M.A. Fan blade axial and radial retention device. 4,478,554, Cl. 416-221.000.
Suwahara, Hirosi: *See*—
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Suzuki, Koji: *See*—
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Suzuki, Shigehisa: *See*—
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Suzuki, Shinichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Avalanche photo-diode bias circuit. 4,479,052, Cl. 250-214.00R.
Suzuki, Sigeru, to Kuroda Precision Industries Ltd. Contact sensor. 4,477,976, Cl. 33-169.00R.
Svensson, Sten-Eric; and Andersson, Gustaf A., to Frigoscandia Contracting AB. Apparatus for heat treatment. 4,478,141, Cl. 99-476.000.
Sweeney, Paula C.: *See*—
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Swenson, Donald A.: *See*—
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Sydansk, Robert D., to Marathon Oil Company. Process for improving waterflood performance in heterogeneous clay-sensitive formations. 4,478,283, Cl. 166-292.000.
Synthelabo: *See*—
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Tabata, Junichi, to Seiko Instruments & Electronics Ltd. Electrochromic display device having constant color density and driving method therefor. 4,479,121, Cl. 340-785.000.
Taboola Pty. Limited: *See*—
Preddey, Brian F., 4,478,061, Cl. 70-358.000.
Tachikawa Spring Co., Ltd.: *See*—
Urai, Muneharu, 4,478,383, Cl. 248-429.000.
Tagami, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Radiator mounting mechanism. 4,478,306, Cl. 180-229.000.
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, to Nippon Soken, Inc. Safety seatbelt retractor. 4,478,433, Cl. 280-807.000.
Taguchi, Mitsuo: *See*—
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Takagi, Norio; and Aoyagi, Hiroshi, to Teijin Limited. Process for preparing cast film of thermoplastic resin. 4,478,772, Cl. 264-22.000.
Takahashi, Mitsuyoshi: *See*—
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Takai, Hiromitsu; and Shibata, Akira, to Nippondenso Co., Ltd. Detecting apparatus using a digital computer. 4,479,190, Cl. 364-556.000.
Takai, Kazuki; Okada, Hitoshi; and Yamaguchi, Katsumi. Auto-loading mechanism in a magnetic recording/reproducing apparatus. 4,479,155, Cl. 360-96.500.
Takai, Kiyoshi: *See*—
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Takai, Toru; Takei, Kenji; and Nagano, Youichi, to Nippon Seiko Kabushiki Kaisha. Conical roller bearing. 4,478,463, Cl. 384-482.000.
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Takao, Mitsunori; and Mizuno, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling an internal combustion engine. 4,479,186, Cl. 364-431.050.
Takara Co., Ltd.: *See*—
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Takatsuji, Masamoto: *See*—
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Takeda Chemical Industries, Inc.: *See*—
Tanaka, Michio; Kamatani, Yoshio; and Nasu, Koji, 4,478,894, Cl. 427-388.200.
Takehara, Masahiro: *See*—
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Takei, Kenji: *See*—
Takai, Toru; Takei, Kenji; and Nagano, Youichi, 4,478,463, Cl. 384-482.000.
Takei, Toshihiro: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,478,550, Cl. 415-53.00T.
Takenaka, Shigeo; and Kamohara, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of shadow mask manufacture. 4,478,589, Cl. 445-37.000.
Takeoka, Yoshikatsu; and Yasuda, Nobuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing optical type recording medium. 4,478,768, Cl. 264-1.400.
Takeshita, Tetsuo: *See*—
Adachi, Takeshi; Takeshita, Tetsuo; and Matsuda, Itsuaki, 4,478,680, Cl. 162-103.000.
Tamai, Yasuo: *See*—
Mizuno, Chiaki; and Tamai, Yasuo, 4,478,908, Cl. 428-327.000.
Tamura, Hifumi; Ishitani, Tohru; and Shimase, Akira, to Hitachi, Ltd. Apparatus for irradiation with charged particle beams. 4,479,060, Cl. 250-398.000.
Tamura, Kohki: *See*—
Fujita, Kazunori; Tamura, Kohki; Kawana, Hidejiro; Iwamoto, Kazuo; and Horiba, Tatsuo, 4,478,917, Cl. 429-33.000.
Tamura, Tadashi, to Carl Freudenberg, Firma. Air filter. 4,478,620, Cl. 55-486.000.
Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Electrostatic recording apparatus. 4,478,504, Cl. 355-1.000.
Tanaka, Hideo: *See*—
Yazaki, Mitsuyoshi; Tanaka, Hideo; and Nakamura, Masayoshi, 4,478,735, Cl. 252-135.000.
Tanaka, Hisashi: *See*—
Watanabe, Osamu; Tanaka, Hisashi; Yoshino, Hitoshi; and Sadamasu, Toshiaki, 4,478,767, Cl. 261-130.000.
Tanaka, Ikuo: *See*—
Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, 4,478,995, Cl. 536-46.000.
Tanaka, Masakazu; and Murayama, Ken, to Toyo Boseki Kabushika Kaisha. Polyvinyl chloride composition. 4,478,961, Cl. 523-105.000.
Tanaka, Michio; Kamatani, Yoshio; and Nasu, Koji, to Takeda Chemical Industries, Inc. One-pack type thermosetting polyurethane coating composition. 4,478,894, Cl. 427-388.200.
Tanaka, Yoshikazu: *See*—
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Tanaka, Yoshio, to Clarion Co., Ltd. Pushbutton tuner. 4,478,097, Cl. 74-10.330.
Tanaka, Yoshio: *See*—
Nishikawa, Yasuhisa; Tanaka, Yoshio; Hasumi, Ryoichi; and Koizumi, Takashi, 4,478,098, Cl. 74-10.330.
Tandberg Data A/S: *See*—
Lia, Herman; and Solhjell, Erik, 4,479,151, Cl. 360-46.000.
Taniguchi, Takashi; and Mibae, Jiro, to Toray Industries, Inc. Anti-fogging coating film. 4,478,909, Cl. 428-331.000.
Tanikawa, Isao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, 4,478,889, Cl. 427-230.000.
Tanner, William D. Air pilot valve controller. 4,478,240, Cl. 137-315.000.
Tanouchi, Masatoshi; and Akiyama, Hirshumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Adsorptive separation method. 4,478,723, Cl. 210-674.000.
Taschner, Heinz: *See*—
Fischer, Wolfgang; Gehre, Gerhard; Korf, Rainer; Lorenz, Renate; and Taschner, Heinz, 4,478,579, Cl. 433-222.000.
Tashiro, Tsuneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing apparatus for improved charging of flying toner. 4,478,505, Cl. 355-3.0DD.
Taub, Alan I.: *See*—
Huang, Shyh-Chin; Chang, Keh-Minn; and Taub, Alan I., 4,478,791, Cl. 420-590.000.
Tavano, John B. Sloped glazing structure. 4,478,013, Cl. 52-92.000.
Taylor, Thomas A.: *See*—
Walker, Lewis; and Taylor, Thomas A., 4,478,207, Cl. 126-101.000.
Tchoukran, Israel: *See*—
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Teijin Limited: *See*—
Takagi, Norio; and Aoyagi, Hiroshi, 4,478,772, Cl. 264-22.000.
Teikoku Chemical Industry Co., Ltd.: *See*—
Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, 4,478,995, Cl. 536-46.000.
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Teknor Apex Company: *See*—
Dickens, David R.; Smith, Waldo; and Malin, Herbert, 4,478,901, Cl. 428-120.000.
Teramachi, Hiroshi. Linear ball bearing unit. 4,478,462, Cl. 308-6.00C.
Terry, F. Duncan: *See*—
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,479,197, Cl. 364-900.000.
Terry, Michael B.: *See*—
Larson, David N.; Ireland, Jeffrey; and Terry, Michael B., 4,479,097, Cl. 331-111.000.
Tessier, Jean; Demoute, Jean-Pierre; and Bonin, Werner, to Roussel Uclaf. Ester. 4,478,850, Cl. 424-304.000.
Tessitore, Pietro T. 2-(1-Alkyl-5-nitro)-imidazolyl-1-(2-hydroxy-5-alkyl)-phenyl carbinols and pharmaceutical compositions containing them. 4,478,846, Cl. 424-273.00R.
Testa, Vincent M., Jr., to Vinal Realty Trust. Tool for use in stripping shingles. 4,477,972, Cl. 30-172.000.
Testut Aequitas: *See*—
Valadier, Jean-Claude, 4,478,093, Cl. 73-862.650.
Texaco Canada Resources Ltd.: *See*—
Klein, George D., 4,478,278, Cl. 166-105.000.
Texaco Inc.: *See*—
Cuscurida, Michael; and Krause, Walter P., 4,479,010, Cl. 564-477.000.

Texas Instruments Incorporated: *See—*
Rodriguez, Arthur M.; and Watkins, Larry L., 4,479,124, Cl. 340-825.440.
Schabowski, John, 4,479,178, Cl. 364-200.000.
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Klietsch, Bernd-Juergen; Kollmeier, Hans-Joachim; Lammerting, Helmut; and Langenhagen, Rolf-Dieter, 4,478,957, Cl. 521-112.000.
Thaler, Warren A.: *See—*
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Thiokol Corporation: *See—*
Johnson, Dell A., 4,478,040, Cl. 60-225.000.
Thompson Bagel Machine Mfg. Corp.: *See—*
Thompson, Daniel T., 4,478,565, Cl. 425-141.000.
Thompson, Daniel T., to Thompson Bagel Machine Mfg. Corp. Compact dough dividing and forming machine. 4,478,565, Cl. 425-141.000.
Thompson, Roger A., to Adolph Coors Company. Variable test air apparatus. 4,478,336, Cl. 209-588.000.
Thompson, Stanley E. Method and apparatus for fan blade tip clearance. 4,478,552, Cl. 415-174.000.
Thompson, William A., Jr., to General Partitions Mfg. Corp. Structural foam partitions. 4,478,019, Cl. 52-239.000.
Thomson-CSF: *See—*
Eumurian, Gregoire; and Gadrault, Robert, 4,479,266, Cl. 455-608.000.
Souchay, Philippe; and Glorie, Maurice, 4,479,252, Cl. 455-223.000.
Three Dimensional Photography Corporation: *See—*
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Tiegel Manufacturing Company: *See—*
Tiegel, Ralph G., 4,478,919, Cl. 429-179.000.
Tiegel, Ralph G., to Tiegel Manufacturing Company. Side terminal lead alloy product and process. 4,478,919, Cl. 429-179.000.
T'Jampens, Germain R.; and Coomans, Abraham, to U.S. Philips Corporation. High-pressure discharge lamp having shielding means comprised of boron nitride. 4,479,071, Cl. 313-25.000.
Tjeba Holding BV: *See—*
van Breest Smallenburg, Tjeerd, 4,477,961, Cl. 29-458.000.
Tobin, Robert A., to Stone Construction Equipment, Inc. Mortar mixer with triple eight mixing action. 4,478,515, Cl. 366-67.000.
Todorof, William J. Multi-layer thin-film, flexible silicon alloy photovoltaic cell. 4,479,027, Cl. 136-249.000.
Tokai Carbon Co., Ltd.: *See—*
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Hirose, Minoru, 4,479,049, Cl. 235-379.000.
Kamata, Isao; and Ohyama, Satoshi, 4,479,165, Cl. 361-335.000.
Kanuma, Akira, 4,479,193, Cl. 364-900.000.
Nagakubo, Yoshihide; and Momose, Hiroshi, 4,478,655, Cl. 148-175.000.
Nagano, Katsumi, 4,479,086, Cl. 323-315.000.
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Nojima, Minejiro; Kobayashi, Makiji; and Kobayashi, Atsushi, 4,479,191, Cl. 364-707.000.
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Tashiro, Tsuneo, 4,478,505, Cl. 355-3.0DD.
Uchida, Yukimasa, 4,479,202, Cl. 365-190.000.
Ueno, Mitsushi; Maoka, Tadanori; Murata, Kenji; and Shirogami, Tamotsu, 4,478,918, Cl. 429-38.000.
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Yamagami, Nobuhiko, 4,479,192, Cl. 364-719.000.
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Tomi Machinery Manufacturing Co., Ltd.: *See—*
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Tominaga, Hiroo; Fujimoto, Kaoru; and Shikada, Tsutomu, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for purifying exhaust gases with hydrogensulfates. 4,478,801, Cl. 423-235.000.
Tomm, Wayne R.; and Ring, Curt, to Bralorne Resources Limited. Jar tool. 4,478,284, Cl. 166-297.000.
Tomyn, Walter W., to Michigan Disposal, Inc. Method for the treatment of waste sludge. 4,478,518, Cl. 366-156.000.
Topfl, Werner: *See—*
Meyer, Willy; Gass, Karl; Topfl, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,478,635, Cl. 71-92.000.
Tophinke, Franz, to CLAAS OHG. Self-propelled harvester thresher with axial product flow. 4,478,226, Cl. 130-27.00T.
Toray Industries, Inc.: *See—*
Kato, Akinori; and Chujo, Yoshihiro, 4,478,508, Cl. 355-14.00R.
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Taniguchi, Takashi; and Mibae, Jiro, 4,478,909, Cl. 428-331.000.
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Totten, Gail S.: *See—*
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Totten, Robert P.; Totten, Gail S.; and Wilson, Mary A., to Mitral Medical International, Inc. Natural tissue heat valve and method of making same. 4,477,930, Cl. 3-1.500.
Toyo Boseki Kabushika Kaisha: *See—*
Tanaka, Masakazu; and Murayama, Ken, 4,478,961, Cl. 523-105.000.
Toyo Kogyo Co., Ltd.: *See—*
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Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,479,068, Cl. 310-194.000.
Kinoshita, Kenzi; Niimi, Yukihide; and Urushidani, Masahiro, 4,478,191, Cl. 123-489.000.
Kinoshita, Kenzi; Niimi, Yukihide; Urushidani, Masahiro; and Ohnaka, Hidemi, 4,478,192, Cl. 123-489.000.
Nakanishi, Kiyoshi; Okumura, Takeshi; Kanda, Mutsumi; Kotani, Takeshi; and Inoue, Tokuta, 4,478,182, Cl. 123-188.00M.
Obayashi, Hideki; Kohama, Tokio; Kawai, Hisasi; Ina, Toshikazu; Sawada, Daisaku; and Shigematsu, Takashi, 4,478,185, Cl. 123-419.000.
Ueda, Masahiro; Noba, Masahiko; Hori, Osamu; Murata, Kimitoshi; and Nakao, Hatsuo, 4,479,063, Cl. 290-30.00R.
Umemoto, Yoshiro; and Sanmiya, Tsugumi, 4,478,447, Cl. 293-102.000.
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Samek, Norbert E., 4,478,495, Cl. 350-392.000.
Trautenberg, Elmar: *See—*
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Hassler, Dieter; and Trautenberg, Elmar, 4,478,084, Cl. 73-620.000.
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Trend Rock Bit Alberta, Ltd.: *See—*
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Tsubota, Nobuyoshi; and Miyake, Ichio, to Mizuno Corporation. Baseball glove. 4,477,927, Cl. 2-19.000.
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Tsuda, Iwao: *See—*
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Tsuji, Sadahiko; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Weighted metering device in camera. 4,478,503, Cl. 354-480.000.
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Tsuzuku, Susumu; Hira, Yasuo; Gotoh, Masao; Yokono, Hitoshi; and Hosoe, Yoshihisa, to Hitachi, Ltd. Screen for projection television. 4,478,902, Cl. 428-174.000.
Tubbs, Dean L. Apparatus for aerating water supplies. 4,478,765, Cl. 261-76.000.
Tucker, Ruth L. Language syntax educational system. 4,478,582, Cl. 434-170.000.
Tullin, Flemming, to Ortofon Manufacturing A/S. Method and plug for securing a connecting wire to a tubular pin. 4,478,475, Cl. 339-97.00R.
Tuominen, Tapio K.: *See—*
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Turner, S. Richard; Walker, Thad O.; and Thaler, Warren A., to Exxon Research & Engineering Co. Sodium styrene sulfonate-co-sodium-n-(4-sulfophenyl)-maleimide- an improved viscosity control additive. 4,478,727, Cl. 252-8.50C.
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Ibrahim, Fayez F., 4,478,047, Cl. 62-82.000.
Ibrahim, Fayez F., 4,478,051, Cl. 62-212.000.
Tyndall, Howard W. Portable workshop. 4,478,467, Cl. 312-250.000.
Uchida, Seiya; and Ashikaga, koichi, to Iwasaki Tsushinki Kabushiki Kaisha. Power source circuit. 4,479,085, Cl. 323-280.000.
Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. CMOS Sense amplifier. 4,479,202, Cl. 365-190.000.
Ueda, Masahiro; Noba, Masahiko; Hori, Osamu; Murata, Kimitoshi; and Nakao, Hatsuo, to Toyota Jidosha Kabushiki Kaisha. Automatic engine stop-restart system. 4,479,063, Cl. 290-30.00R.
Uede, Hisashi: *See—*
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Ueno, Mitsushi; Maoka, Tadanori; Murata, Kenji; and Shirogami, Tamotsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Fuel cell stack. 4,478,918, Cl. 429-38.000.
Uffner, William E.; White, Robert N.; and Harrington, Edward R., to Owens-Corning Fiberglas Corporation. Blended pressure-sensitive asphaltic based adhesives. 4,478,912, Cl. 428-349.000.
Uhrin, Robert: *See—*
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Ui, Michio: *See—*
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Umemoto, Yoshiro; and Sanmiya, Tsugumi, to Toyota Jidosha Kabushiki Kaisha. Textured surface pattern for an automobile bumper. 4,478,447, Cl. 293-102.000.
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Unger, Hans W.: *See—*
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Union Carbide Corporation: *See—*
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Langan, Richard A., 4,478,921, Cl. 429-194.000.
Liang, Wei C., 4,479,002, Cl. 546-335.000.
Union Oil Company of California: *See—*
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Uniroyal, Inc.: *See—*
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United Kingdom Atomic Energy Authority: *See—*
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Agriculture: *See—*
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Heiland, Wolfgang K.; and Magidman, Paul, 4,478,096, Cl. 73-864.730.
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Hopkins, William J.; Sweeney, Paula C.; and Bailey, David G., 4,478,728, Cl. 252-8.570.
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Sayler, William M.; and Hayner, John M., 4,478,150, Cl. 102-430.000.
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Burelbach, James P., 4,478,784, Cl. 376-298.000.
Holland, James R.; and Del Vecchio, Robert M., 4,477,958, Cl. 29-423.000.
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McNeilly, David R.; and Miller, William R., 4,479,113, Cl. 340-501.000.
Morris, Christopher L.; Idzorek, George C.; and Atencio, Leroy G., 4,479,059, Cl. 250-385.000.
National Aeronautics and Space Administration: *See—*
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Berry, Alan D., 4,478,890, Cl. 427-252.000.
Black, William L.; and Moore, Kenneth L., 4,478,128, Cl. 89-7.000.
Fletcher, Aaron N., 4,479,223, Cl. 372-53.000.
Hennings, George N.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,478,127, Cl. 89-1.50D.
Hennings, George N.; Brauer, Larry F.; and Nickles, Richmond H., 4,478,147, Cl. 102-255.000.
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T'Jampens, Germain R.; and Coomans, Abraham, 4,479,071, Cl. 313-25.000.
Van Daelen, Henri J. G. M., 4,479,073, Cl. 313-451.000.
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Honeycutt, Fred L., Jr.; and Lindstrom, Erik A., 4,478,551, Cl. 415-142.000.
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Kesten, Arthur S.; and Couch, Harold T., 4,478,814, Cl. 423-650.000.
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Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Fuel grinding apparatus. 4,478,371, Cl. 241-18.000.

Williamson, Robert R.: *See*—
Derby, Norwin C.; and Williamson, Robert R., 4,479,243, Cl. 383-24.000.

Wilson, John C.: *See*—
Yacobucci, Paul D.; and Wilson, John C., 4,478,992, Cl. 526-288.000.

Wilson, John F.: *See*—
Marshall, Peter E. G.; Piper, Francis R.; and Wilson, John F., 4,477,986, Cl. 73-40.700.

Wilson, Mary A.: *See*—
Totten, Robert P.; Totten, Gail S.; and Wilson, Mary A., 4,477,930, Cl. 3-1.500.

Wimmer, Robert C. Door brace and alarm device. 4,478,168, Cl. 116-82.000.

Winchell, David F.: *See*—
Bass, Ann H.; Blaschak, Jeffery G.; Marouf, Mohamed A.; Vancil, Paul W.; and Winchell, David F., 4,479,211, Cl. 370-62.000.

Winsel, August, to Varta Batterie Aktiengesellschaft. Method and apparatus for operating aqueous galvanic high energy cells. 4,478,916, Cl. 429-9.000.

Winteraire, Inc.: *See*—
Venditti, Paul L.; and Bayer, Harmon S., 4,478,138, Cl. 98-33.00R.

Wittwer, Fritz, to Warner-Lambert Company. Method for sealing non-enteric capsules. 4,478,658, Cl. 156-69.000.

Wochok, Zachary S.; and Sluis, Carolyn J., to Plant Resources Institute. Process for stimulating asexual propagation of *Simmondsia chinensis* tissue. 4,478,000, Cl. 47-58.000.

Woermbke, James D. Fish net. 4,477,993, Cl. 43-11.000.

Wojtyna, Vincent J.: *See*—
Carlson, John D.; Kifer, Edward W.; Wojtyna, Vincent J.; and Colton, James P., 4,478,958, Cl. 521-121.000.

Wolf, Elmar, to Outils Wolf, Sarl. Lawnmowers with rotatable cutting blades. 4,478,031, Cl. 56-202.000.

Wolf, Sylvan: *See*—
Applebaum, Albert; Will, Albert S.; Humphrey, Samuel A.; McLean, Frank C.; Wolf, Sylvan; Peterson, Carl R.; Gauzza, Harry J.; and Hetzler, John C., 4,478,148, Cl. 102-390.000.

Wollschlager, Joseph F.: *See*—
Brenner, Kenneth I.; and Wollschlager, Joseph F., 4,478,130, Cl. 91-6.500.

Wolters, Gerardus A. M., to U.S. Philips Corporation. Arrangement for and method of detecting multi-frequency sound code signals. 4,479,229, Cl. 375-89.000.

Womack, James A.: *See*—
Long, Jerry M.; and Womack, James A., 4,478,335, Cl. 206-444.000.

Wondra, Arthur: *See*—
Rosenfeldt, Bernd; Weller, Gerhard; Wondra, Arthur; and Reis, Edmund, 4,479,263, Cl. 455-602.000.

Wood, Charles L.; Mapes, Glenn H.; and Daudt, Stephen W., to Ball Corporation. Power failure detection system for a glassware forming machine. 4,478,629, Cl. 65-163.000.

Wood, Robin: *See*—
Brittain, David R.; and Wood, Robin, 4,478,847, Cl. 424-274.000.

Woodhead, James S.: *See*—
Campbell, Anthony K.; Simpson, John S. A.; and Woodhead, James S., 4,478,817, Cl. 424-7.100.

Wooding, Michael S.: *See*—
Fletcher, James; and Wooding, Michael S., 4,478,377, Cl. 244-12.500.

Woodings, Robert T. Class D sucker rods. 4,478,652, Cl. 148-36.000.

Woods, Gordon D.: *See*—
Redman, Brian E.; and Woods, Gordon D., 4,479,122, Cl. 340-825.060.

Woods, James A.: *See*—
Hogan, Tanai N.; and Woods, James A., 4,478,001, Cl. 49-37.000.

Woodson, Wayne D., to CL Industries, Inc. Binder compositions comprising furfuryl ester and furfuryl ester-furuyl alcohol combinations. 4,478,962, Cl. 523-144.000.

Woodward, John W.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Stewart, William H.; and Woodward, John W., 4,479,034, Cl. 179-18.0ES.

Wreede, John E.; and Arns, James A., to Hughes Aircraft Company. Noise reduction in coherent systems. 4,478,490, Cl. 350-162.110.

Wuchner, Fritz: *See*—
Krevet, Berthold; Schauer, Wolfgang; and Wuchner, Fritz, 4,478,877, Cl. 427-62.000.

Wunsch, Lutz: *See*—
Gast, Jurgen; Wunsch, Lutz; and Zachmann, Gunter, 4,479,058, Cl. 250-343.000.

Wurscher, Robert J.: *See*—
Amundson, Arlon J.; and Wurscher, Robert J., 4,478,352, Cl. 221-13.000.

Xerox Corporation: *See*—
Daughton, John W.; Gray, Gary A.; Wilczek, Stephen A.; and Steiner, Edward, 4,478,509, Cl. 355-14.00C.
Garavuso, Gerald M., 4,478,404, Cl. 271-212.000.
Sprague, Robert A., 4,478,483, Cl. 350-96.140.
Zoltner, John D., 4,478,512, Cl. 355-3.0DD.

Xomox Corporation: *See*—
George, John A., 4,478,388, Cl. 251-309.000.

Yabuoshi, Susumu; Uzura, Shogo; and Hayashi, Nobuyuki, to Nippondenso Co., Ltd. Met²od for making the stator for electric motor. 4,477,967, Cl. 29-596.000.

Yacobucci, Paul D.; and Wilson, John C., to Eastman Kodak Company. Polymerizable vinyl benzoates. 4,478,992, Cl. 526-288.000.

Yaesu Musen Co., Ltd.: *See*—
Akiyama, Koji, 4,479,257, Cl. 455-266.000.

Yamada, Keiichi, to Diesel Kiki Co., Ltd. Distribution type fuel injection apparatus. 4,478,187, Cl. 123-449.000.

Yamagami, Nobuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Straight line coordinates generator. 4,479,192, Cl. 364-719.000.

Yamagishi, Kagari: *See*—
Itho, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; and Yamagishi, Kagari, 4,478,838, Cl. 424-250.000.

Yamaguchi, Katsumi: *See*—
Takai, Kazuki; Okada, Hitoshi; and Yamaguchi, Katsumi, 4,479,155, Cl. 360-96.500.

Yamaguchi, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Musical envelope control device. 4,478,525, Cl. 368-273.000.

Yamamoto, Seiichi; and Kitayama, Seishi, to Kokusai Denshin Denwa Kabushiki Kaisha. Echo control system. 4,479,036, Cl. 179-170.200.

Yamamoto, Yoshimi: *See*—
Matsuoka, Hideoki; and Yamamoto, Yoshimi, 4,478,432, Cl. 280-804.000.

Yamamoto, Yujiro. Omnidirectional acceleration alarm and switch therefor. 4,479,114, Cl. 340-566.000.

Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, to Nissan Motor Company, Limited. Hydraulic control system for continuously variable V-belt transmission with hydrodynamic transmission unit. 4,478,105, Cl. 74-730.000.

Yamanouchi, Katsuto: *See*—
Yasuhara, Seishi; and Yamanouchi, Katsuto, 4,478,197, Cl. 123-514.000.

Yamaoka, Tetsuo; and Iwata, Hiroshi, to West Electric Co., Ltd. Power saving device for electronic flash. 4,479,076, Cl. 315-241.00P.

Yamasa Shoyu Kabushiki Kaisha: *See*—
Sato, Tomokazu; and Ui, Michio, 4,478,934, Cl. 435-7.000.

Yamato, Akihiro; Koike, Akihiko; Hosokawa, Takehiko; and Maruyama, Nobutoshi, to Honda Motor Co., Ltd. Fuel supply control method for internal combustion engines immediately after cranking. 4,478,194, Cl. 123-491.000.

Yamazaki, Shigeru; and Takano, Yoshiaki, to Sony Corporation. Video projecting apparatus. 4,479,144, Cl. 358-60.000.

Yan, Tsoung-Yuan, to Mobil Oil Corporation. Process for stabilizing dewaxed distillate oils. 4,478,709, Cl. 208-257.000.

Yano, Nobuyuki; Kotera, Takuro; Aoki, Akira; and Utagawa, Toshio, to Toyota Jidosha Kabushiki Kaisha. Air-conditioning machine. 4,478,053, Cl. 62-262.000.

Yanov, David A.: *See*—
Koch, Ronald N.; and Yanov, David A., 4,478,440, Cl. 285-392.000.

Yasuda, Eturo: *See*—
Ohta, Minoru; Yasuda, Eturo; Kawakami, Tomio; and Kotanshi, Yoichi, 4,478,067, Cl. 73-23.000.

Yasuda, Mieji, to Nihon Keiki Co., Ltd. Nail polisher. 4,478,232, Cl. 132-73.600.

Yasuda, Nobuaki: *See*—
Takeoka, Yoshikatsu; and Yasuda, Nobuaki, 4,478,768, Cl. 264-1.400.

Yasuda, Tadahiko: *See*—
Shinoda, Masamitu; Tanaka, Ikuo; Yasuda, Tadahiko; Nakajima, Isao; Adachi, Tutomu; and Ikeda, Giichi, 4,478,995, Cl. 536-46.000.

Yasuhara, Seishi; and Yamanouchi, Katsuto, to Nissan Motor Company. Fuel supply apparatus for a diesel engine. 4,478,197, Cl. 123-514.000.

Yates, Roy K., to General Electric Company. Additive dispenser system for clothes washing appliance. 4,478,059, Cl. 68-17.00A.

Yazaki, Mitsuyoshi; Tanaka, Hideo; and Nakamura, Masayoshi, to Lion Corporation. Process for producing granular detergent composition. 4,478,735, Cl. 252-135.000.

Yeda Research & Development Company, Ltd.: *See*—
Halmann, Martin M.; Ulman, Mira; and Aurian-Blajeni, Benedict, 4,478,699, Cl. 204-158.00R.
Vofsi, David; Reich, Shymon; Tchoukran, Israel; and Mayoral, Joaquin, 4,478,770, Cl. 264-2.100.

Yee, Tin B. Method for repairing heels of shoes. 4,478,774, Cl. 264-36.000.

Yie, Gene G., to Fluidyne Corporation. High velocity particulate containing fluid jet apparatus and process. 4,478,368, Cl. 239-430.000.

Yokono, Hitoshi: *See*—
Tsuzuku, Susumu; Hira, Yasuo; Gotoh, Masao; Yokono, Hitoshi; and Hosoe, Yoshihisa, 4,478,902, Cl. 428-174.000.

Yokota, Hideo, to Canon Kabushiki Kaisha. Apparatus having liquid crystal finder optical system. 4,478,493, Cl. 350-336.000.

Yokoya, Satoshi; and Numata, Norio, to Sony Corporation. AM Stereophonic demodulating circuit. 4,479,234, Cl. 381-15.000.

Yokoyama, Toshiharu: *See*—
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,478,956, Cl. 521-32.000.

Yoneyama, Takao: *See*—
Sato, Ichiya; Yoneyama, Takao; Koga, Tsuguaki; Ikeuchi, Kazuo; and Hisano, Katsukuni, 4,478,082, Cl. 73-593.000.

Yoshikawa, Masanori: *See*—
Miyoshi, Tadahiko; Yoshikawa, Masanori; and Taguchi, Mitsuo, 4,478,704, Cl. 204-412.000.

Yoshino, Hitoshi: *See*—
Watanabe, Osamu; Tanaka, Hisashi; Yoshino, Hitoshi; and Sadamasu, Toshiaki, 4,478,767, Cl. 261-130.000.

Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, to Shionogi & Co., Ltd. 1-Oxadethiacepham compounds. 4,478,997, Cl. 544-71.000.

Yoshioka, Seishiro; Hirai, Yutaka; Fukuda, Tadaji; Fukaya, Masaki; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Photo-electric converter and image forming apparatus incorporating the same. 4,479,149, Cl. 358-294.000.

Yoshisato, Akiyuki, to Alps Electric Co., Ltd. Phase locked loop FM demodulator with variable bandwidth loop filter. 4,479,091, Cl. 329-122.000.

You, Yun-Long. Fantastic wall-climbing toy. 4,477,998, Cl. 446-177.000.

Young, Michael F., to Buttonwood Communication Corporation. Communication system to simultaneously operate a plurality of RF transceivers in a confined area. 4,479,246, Cl. 455-50.000.

Young, Vernon V.: *See*—
Williams, Robert D.; Bright, David R.; Young, Vernon V.; and Martin, Jerome L., 4,478,935, Cl. 435-75.000.

Young, William R.: *See*—
Smith, Murray S., Jr.; Perkins, Roger J.; Fryxell, Robert E.; and Young, William R., 4,478,638, Cl. 75-255.000.

Yuan-Hsiang, Chen. Sanitary sandals. 4,477,985, Cl. 36-11.500.

Yue, Robert H.: *See*—
Landaburu, Ricardo H.; Yue, Robert H.; Farb, David L.; and Violand, Bernard N., 4,478,829, Cl. 424-177.000.

Yuki, Heimei; and Okamoto, Yoshio, to Daicel Chemical Industries, Ltd. Polymerization process of optically active polymer and catalyst therefor. 4,478,953, Cl. 502-155.000.

Yukimoto, Yoshinori: *See*—
Sato, Kazuhiko; Nakamura, Genshiro; and Yukimoto, Yoshinori, 4,479,028, Cl. 136-249.000.

Z. Bavelloni S.P.A.: *See*—
Bavelloni, Franco, 4,478,007, Cl. 51-100.00R.

Zachmann, Gunter: *See*—
Gast, Jurgen; Wunsch, Lutz; and Zachmann, Gunter, 4,479,058, Cl. 250-343.000.

Zado, Frank M., to AT&T Technologies, Inc. Water soluble flux. 4,478,650, Cl. 148-23.000.

Zaelke, Arnold E. Method and apparatus for refurbishment of plastic containers. 4,478,781, Cl. 264-341.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Schreiner, Friedrich, 4,478,106, Cl. 74-740.000.

Zambrano, Adolfo R., to Hanna Mining Company, The. Dry scrubbing of SO_2 from mixtures. 4,478,803, Cl. 423-244.000.

Zansky, Zoltan: *See*—
Gille, Robert A.; Planer, Norman G.; and Zansky, Zoltan, 4,479,175, Cl. 363-41.000.

Zapolski, Edward J.: *See*—
Ledley, Robert S.; and Zapolski, Edward J., 4,478,816, Cl. 424-4.000.

Zbaida, Shmuel: *See*—
Sasson, Yoel; and Zbaida, Shmuel, 4,479,015, Cl. 568-584.000.

Zech, Hans-Joachim: *See*—
Doerffel, Joerg; and Zech, Hans-Joachim, 4,478,994, Cl. 528-304.000.

Zeeh, Bernd: *See*—
Schulz, Gunter; Buschmann, Ernst; and Zeeh, Bernd, 4,478,758, Cl. 260-465.00D.

Zeilinger, Hans; Muhlratzer, August; and Stemmler, Bruno, to MAN Maschinenfabrik Augsburg-Nurnberg AG. Method of producing protective oxide layers. 4,478,648, Cl. 148-6.300.

Zeller, Albert M.; and Janes, Edward W., to Illinois Tool Works Inc. Adhesive bonded gun assembly for applying fastener. 4,478,669, Cl. 156-379.700.

Zemann, Arnold: *See*—
Beier, Lothar; Zemann, Arnold; and Wachter, Helmut, 4,479,137, Cl. 346-141.000.

Zero Corporation: *See*—
Waite, Robert J.; and Almeida, Ronald P., 4,478,469, Cl. 339-17.0LC.

Ziebold, Steven A.: *See*—
McAlister, Donald R.; and Ziebold, Steven A., 4,478,809, Cl. 423-522.000.

Ziegler, William H., Jr., to Brown Group Recreational Products, Inc. Flexible swing seat. 4,478,410, Cl. 272-85.000.

Zielke, Wayne T.: *See*—
Konyn, Dale R.; and Zielke, Wayne T., 4,478,033, Cl. 56-400.060.

Zierhut, Hermann, to Richard Hirschmann Radiotechnisches Werk. Motion detector for space surveillance. 4,479,056, Cl. 250-342.000.

Ziliani, Franco, to Norda Tubazioni S.P.A. Folding cart for serving meals or the like. 4,478,428, Cl. 280-651.000.

Zimmerman, John D., to Bunn-O-Matic Corporation. Beverage making machine. 4,478,139, Cl. 99-280.000.

Zimmermann & Jansen GmbH: *See*—
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, 4,478,129, Cl. 91-1.000.

Zinn, Nils: *See*—
Andersson, Karl-Hugo; and Zinn, Nils, 4,477,983, Cl. 34-114.000.

Zobel, Frederick A.; Burke, Joseph D.; and Oppy, John T., to General Foods Corporation. Process for whipping an emulsion. 4,478,867, Cl. 426-570.000.

Zoltner, John D., to Xerox Corporation. Toner cartridge for use in an electrophotographic printing machine. 4,478,512, Cl. 355-3.0DD.

Zopf, Richard F.: *See*—
Keane, John J.; and Zopf, Richard F., 4,478,932, Cl. 430-314.000.

Zuckerwar, Allan J., to United States of America, National Aeronautics and Space Administration. Flow resistivity instrument in the earth. 4,478,069, Cl. 73-38.000.

3Com Corporation: *See*—
Crane, Ronald C., 4,479,228, Cl. 375-7.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF OCTOBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Daikin Kogyo Co., Ltd.: *See*—
Horiuchi, Takeshi, Re. 31,711, Cl. 417-222.000.

Ford, Eric H., to Lumenition Limited. Ignition systems for internal combustion engines. Re. 31,709, Cl. 123-416.000.

Giese, Roger W. Biochemical avidin-biotin multiple-layer system. Re. 31,712, Cl. 428-407.000.

Harris Corporation: *See*—
Jackson, Dale H., Re. 31,710, Cl. 270-57.000.

Horiuchi, Takeshi, to Daikin Kogyo Co., Ltd. Variable delivery hydraulic pump. Re. 31,711, Cl. 417-222.000.

Jackson, Dale H., to Harris Corporation. Personalized on-line printing and inserting magazine binding machine. Re. 31,710, Cl. 270-57.000.

Lumenition Limited: *See*—
Ford, Eric H., Re. 31,709, Cl. 123-416.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Golden, Steven T. Line tensioner. B1 4,377,886, 10-23-84, Cl. 24-71.100.

IMDEC S.R.L.: *See*—
Silvestrini, Jesus A., B1 4,355,572, Cl. 99-516.000.

Schultz, Sidney J.: *See*—
Wynstra, John; and Schultz, Sidney J., B1 4,206,095, Cl. 528-137.000.

Silvestrini, Jesus A., to IMDEC S.R.L. Apparatus for separating the pulp from the skin of fruit such as tomatoes. B1 4,355,572, 10-23-84, Cl. 99-516.000.

Union Carbide Corporation: *See*—
Wynstra, John; and Schultz, Sidney J., B1 4,206,095, Cl. 528-137.000.

Wynstra, John; and Schultz, Sidney J., to Union Carbide Corporation. Process for producing particulate resoles from aqueous dispersion. B1 4,206,095, 10-23-84, Cl. 528-137.000.

LIST OF DESIGN PATENTEES

Albert, Fritz T.; and Hellein, Ernst F. W. Container cap. 276,027, 10-23-84, Cl. D9-452.000.

American Standard Inc.: *See*—
Stairs, Henry M., Jr., 276,064, Cl. D23-28.000.

AT&T Bell Laboratories: *See*—
Genaro, Donald M.; Gotway, Jerome M.; Hall, Norris R.; and McGarvey, John N., 276,046, Cl. D14-60.000.

Battista, Vincent, to Farley Candy Company. Storage and dispensing container. 276,020, 10-23-84, Cl. D7-79.000.

Black & Decker Inc.: *See*—
Wagster, Robert P., 276,074, Cl. D25-67.000.

Boehle, William F.; and Heiter, Michael J. Insurance calculator. 276,053, 10-23-84, Cl. D18-7.000.

Bottorff, Boyd G., to Williams Industries, Inc. Hanger for a tubular container. 276,008, 10-23-84, Cl. D6-513.000.

Bowe, Gerald R.: *See*—
Wedel, John A.; Karjala, Larry M.; and Bowe, Gerald R., 276,052, Cl. D16-33.000.

Bowen, Robert F.; and Martel, Thomas J., to Raytheon Company. Microwave egg cooker. 276,022, 10-23-84, Cl. D7-360.000.

Brewster, Ronald E. Combined salt and pepper shaker. 276,017, 10-23-84, Cl. D7-57.000.

Bulgari, Gianni, to Ditta SOTIRIO BULGARI di Costantino e Giorgio Bulgari S.a.s. Necklace. 276,030, 10-23-84, Cl. D11-13.000.

Carbajales Santa-Eulalia, Javier B.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 276,031, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison and Company. Figurine of an Afghan. 276,031, 10-23-84, Cl. D11-158.000.

Casa Bella Imports, Inc.: *See*—
Matthias, Jan H., 276,083, Cl. D26-104.000.

Chatani, Yasusi, to Kawada Co., Ltd. Activity toy or the like. 276,056, 10-23-84, Cl. D21-59.000.

Cheng, Lap-Kwan, to Hang Ho Industrial Co. Limited. Multi-purpose lantern. 276,079, 10-23-84, Cl. D26-42.000.

Christien, Francis R., to Merit Company, The. Casket trimming. 276,091, 10-23-84, Cl. D99-8.000.

Clark, Cecily M.: *See*—
Rassias, John N.; and Clark, Cecily M., 276,075, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M., 276,076, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M., 276,077, Cl. D25-91.000.
Rassias, John N.; and Clark, Cecily M., 276,078, Cl. D25-91.000.
Rassias, John N.; and Clark, Cecily M., 276,081, Cl. D25-89.000.
Rassias, John N.; and Clark, Cecily M., 276,082, Cl. D25-91.000.

Consolidated Foods Corporation: *See*—
Di Tullio, Flavia, 276,002, Cl. D2-24.000.
Locascio, Jack, 276,000, Cl. D2-24.000.
Locascio, Jack, 276,001, Cl. D2-24.000.
Martini, Jeanne M., 275,999, Cl. D2-24.000.

Crotty, Charles A.; Payne, George L.; and Perrins, Allen R., to Superior Electric Company, The. Line voltage monitor system. 276,028, 10-23-84, Cl. D10-75.000.

Culture Tek Corporation: *See*—
Malinoff, Don, 276,071, Cl. D24-31.000.

Dennis, Frank S., to Molded Products Company. Balance exerciser. 276,062, 10-23-84, Cl. D21-193.000.

Ditta SOTIRIO BULGARI di Costantino e Giorgio Bulgari S.a.s.: *See*—
Bulgari, Gianni, 276,030, Cl. D11-13.000.

Di Tullio, Flavia, to Consolidated Foods Corporation. Brassiere. 276,002, 10-23-84, Cl. D2-24.000.

Emerson Electric Co.: *See*—
Skowronski, Roman L.; and Szekeres, John M., 276,024, Cl. D9-415.000.

Emmendorfer, Charles V. Fireplace heating appliance. 276,066, 10-23-84, Cl. D23-95.000.

Epson Corporation: *See*—
Tanaka, Kiyoaki, 276,039, Cl. D12-192.000.

Ernest, Robert O.; and Long, Douglas G., to Sunbeam Corporation. Curler/styler. 276,086, 10-23-84, Cl. D28-35.000.

Farley Candy Company: *See*—
Battista, Vincent, 276,020, Cl. D7-79.000.

Ferrin, Kenneth M. Pepper mill. 276,016, 10-23-84, Cl. D7-53.000.

Fido, Stafan. Toothbrush. 276,005, 10-23-84, Cl. D4-104.000.

Fitzner, Marcel; and Pinnell, Vesta P., Jr. Microphone stand detachable tray or the like. 276,043, 10-23-84, Cl. D14-13.000.

Folkmar, Jan. Package for frozen liquids. 276,049, 10-23-84, Cl. D15-90.000.

Fong, Alex B. Y. Combined dental floss holder and toothpick. 276,088, 10-23-84, Cl. D28-64.000.

Freezinhot Bottle Co., Ltd.: *See*—
Kung, Chi H., 276,080, Cl. D26-48.000.
Gateway Scientific, Inc.: *See*—
Skarman, John S., 276,029, Cl. D10-106.000.
Genaro, Donald M.; Gotway, Jerome M.; Hall, Norris R.; and McGarvey, John N., to AT&T Bell Laboratories. Housing for a telephone. 276,046, 10-23-84, Cl. D14-60.000.
Gervais, Conrad, to Le Balai Laviolette Enr. Molded broom head for use on a broom ball stick. 276,063, 10-23-84, Cl. D21-210.000.
Gibson, David I., to Nestier Canada, Inc. Container for carrying articles. 276,090, 10-23-84, Cl. D34-43.000.
Giles, William. Housing for an evaporator unit of a split system air conditioner. 276,070, 10-23-84, Cl. D23-141.000.
Gotway, Jerome M.: *See*—
Genaro, Donald M.; Gotway, Jerome M.; Hall, Norris R.; and McGarvey, John N., 276,046, Cl. D14-60.000.
Guertin, Joseph G. American family tree game panel or similar article. 276,055, 10-23-84, Cl. D21-25.000.
Hagedorn, Leonhard; and Schulein, Rolf-Gunter, to ITT Industries, Inc. Combined rack, vegetable peeler, and knife. 276,018, 10-23-84, Cl. D7-74.000.
Hall, Norris R.: *See*—
Genaro, Donald M.; Gotway, Jerome M.; Hall, Norris R.; and McGarvey, John N., 276,046, Cl. D14-60.000.
Hang Ho Industrial Co. Limited: *See*—
Cheng, Lap-Kwan, 276,079, Cl. D26-42.000.
Hannecke, Wolf-Dietrich. Display rack module. 276,011, 10-23-84, Cl. D6-510.000.
Harris, Frank I., to Minibar Limited. Refrigerated cabinet for beverage containers. 276,048, 10-23-84, Cl. D15-86.000.
Hayashi, Shigeaki: *See*—
Kosako, Mikio; and Hayashi, Shigeaki, 276,051, Cl. D16-31.000.
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Kotyuk, Ben, Jr., to Primary Development Group. Cosmetic container. 276,087, 10-23-84, Cl. D28-79.000.
Koustis, Evangelos. Carrying tray for dining table set-up needs. 276,019, 10-23-84, Cl. D7-74.000.
Kung, Chi H., to Freezinhot Bottle Co., Ltd. Torch. 276,080, 10-23-84, Cl. D26-48.000.
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Wedel, John A.; Karjala, Larry M.; and Bowe, Gerald R., to Pako Corporation. Photographic print paper magazine with multi-position handle. 276,052, 10-23-84, Cl. D16-33.000.
Westcott, Edgar C.; and Wilson, Robert P., to Really Me. Ltd. Mirror. 276,012, 10-23-84, Cl. D6-301.000.
Whitehead, Howard A., to Kimberly-Clark Corporation. Thin absorbent pad. 276,072, 10-23-84, Cl. D24-51.000.
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Willis, Robert D., to Ride-On Enterprises, Inc. Bicycle seat cover. 276,006, 10-23-84, Cl. D6-502.000.
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Chamberlin, Thomas O., Sr., to H. P. Metzler & Sons, Inc. Peach tree, Berenda Sun. 5,297, 10-23-84, Cl. 43.000.
Chopin, David E., to Chopin & Wright. Crepe Myrtle. 5,302, 10-23-84, Cl. 54.000.
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Hemenway, Frederick H. Variety of apricot tree. 5,296, 10-23-84, Cl. 39.000.
Johnson, Harold A., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant—'The Crown'. 5,301, 10-23-84, Cl. 49.000.
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Siri, Angelo J., to Siri Brothers Nursery, Inc. Miniature carnation. 5,303, 10-23-84, Cl. 70.000.
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Whitsell, Robert H., 5,299, Cl. 44.000.
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 23, 1984

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861.22 4,478,087
861.28 4,478,088
862.04 4,478,089
862.09 4,478,090
862.54 4,478,091
862.55 4,478,092
862.65 4,478,093
863.32 4,478,094
864.21 4,478,095
864.73 4,478,096

CLASS 74

10.33 4,478,097
4,478,098
11 4,478,099
206 4,478,100
325 4,478,101
410 4,478,102
425 4,478,103
479 4,478,104
730 4,478,105
740 4,478,106
863 4,478,107
866 4,478,108
878 4,478,109

CLASS 75

67 R 4,478,637
255 4,478,638

CLASS 81

9.51 4,478,110
57.19 4,478,111
57.37 4,478,112
64 4,478,113
363 4,478,114
436 4,478,115

CLASS 82

4 A 4,478,116
32 4,478,117

CLASS 83

24 4,478,118
42 4,478,119
71 4,478,120
209 4,478,121
549 4,478,122

CLASS 84

1.03 4,478,123
1.19 4,478,124
212 4,478,125

CLASS 86

1 B 4,478,126

CLASS 89

1.5 D 4,478,127
7 4,478,128

CLASS 91

1 4,478,129
6.5 4,478,130
356 4,478,131
485 4,478,132
488 4,478,133
4,478,134
492 4,478,135
506 4,478,136

CLASS 92

63 4,478,137

CLASS 98

33 R 4,478,138

CLASS 99

280 4,478,139
404 4,478,140
476 4,478,141
516 B1 4,355,572

CLASS 073

55 4,478,071

CLASS 101

35 4,478,142
93.05 4,478,143
126 4,478,144
205 4,478,145
4,478,146

CLASS 102

255 4,478,147
390 4,478,148
426 4,478,149
430 4,478,150
481 4,478,151

CLASS 104

279 4,478,152

CLASS 105

168 4,478,153
225 4,478,154
355 4,478,155

CLASS 106

76 4,478,640
110 4,478,641
277 4,478,642
288 Q 4,478,643

CLASS 108

53.1 4,478,156

CLASS 110

106 4,478,157
215 4,478,158

CLASS 111

52 4,478,159

CLASS 112

121.12 4,478,160
155 4,478,161
227 4,478,162
287 4,478,163

CLASS 114

39 4,478,164
74 R 4,478,165
290 4,478,166
352 4,478,167

CLASS 116

82 4,478,168
209 4,478,169

CLASS 118

64 4,478,170
4,478,171
4,478,172
688 4,478,173
718 4,478,174

CLASS 119

16 4,478,175
159 4,478,176

CLASS 123

1 A 4,478,177
41.01 4,478,178
44 B 4,478,179
59 BS 4,478,180
145 A 4,478,181
188 M 4,478,182
339 4,478,183
352 4,478,184
416 Re.31,709
419 4,478,185
436 4,478,186
449 4,478,187
450 4,478,188
467 4,478,189
478 4,478,190
489 4,478,191
4,478,192
4,478,193
491 4,478,194
502 4,478,195
504 4,478,196
514 4,478,197
548 4,478,198
571 4,478,199
605 4,478,200
620 4,478,201

CLASS 124

23 R 4,478,202
24 R 4,478,203
89 4,478,204

CLASS 126

25 R 4,478,205
99 A 4,478,206
101 4,478,207
121 4,478,208
417 4,478,209
418 4,478,210
433 4,478,211

CLASS 127

1 4,478,644
57 4,478,645

CLASS 128

6 4,478,212
25 R 4,478,213
149 4,478,214
201.13 4,478,215
204.21 4,478,216
303.1 4,478,217
325 4,478,218
4,478,219
326 4,478,220
334 R 4,478,221
632 4,478,222
699 4,478,223
706 4,478,224
4,478,225

CLASS 130

27 T 4,478,226
30 R 4,478,227

CLASS 131

84 C 4,478,231
180 4,478,228
234 4,478,230
336 4,478,229

CLASS 132

73.6 4,478,232
84 D 4,478,233

CLASS 134

7 4,478,646
13 4,478,647

CLASS 135

98 4,478,234

CLASS 136

232 4,479,026
249 4,479,027
4,479,028

CLASS 137

15 4,478,235
107 4,478,236
116.3 4,478,237
171 4,478,238
209 4,478,239
315 4,478,240
340 4,478,241
383 4,478,242
512.1 4,478,243
515 4,478,244
554 4,478,245
557 4,478,246
580 4,478,247
624.13 4,478,248
625.4 4,478,249
625.65 4,478,250

CLASS 138

44 4,478,251
140 4,478,252
4,478,253

CLASS 139

1 E 4,478,254
21 4,478,255
54 4,478,256
110 4,478,257
358 4,478,258
435 4,478,259

CLASS 140

92.1 4,478,260

CLASS 141

2 4,478,261
114 4,478,262

CLASS 144

3 K 4,478,263
83 4,478,264

CLASS 148

6.3 4,478,648
12 C 4,478,649
23 4,478,650
31.5 4,478,651
36 4,478,652
111 4,478,653
174 4,478,654

175 4,478,655

CLASS 149

19.4 4,478,656

CLASS 150

52 R 4,478,265

CLASS 152

209 R 4,478,266

CLASS 156

64 4,478,657
69 4,478,658
73.1 4,478,659
78 4,478,660
92 4,478,661
155 4,478,662
203 4,478,663
216 4,478,664
229 4,478,665
240 4,478,666
307.3 4,478,667
364 4,478,668
379.7 4,478,669
380.1 4,478,670
391 4,478,671
421 4,478,672
498 4,478,673
505 4,478,674
605 4,478,675
616 R 4,478,676
635 4,478,677
643 4,478,678
653 4,478,679

CLASS 160

97 4,478,267
310 4,478,268

CLASS 162

103 4,478,680
140 4,478,681
158 4,478,682
161 4,478,683
337 4,478,684

CLASS 164

21 4,478,269
254 4,478,270
426 4,478,271
454 4,478,272
468 4,478,273

CLASS 165

12 4,478,274
133 4,478,275
164 4,478,276
185 4,478,277

CLASS 166

105 4,478,278
121 4,478,279
260 4,478,280
274 4,478,281
281 4,478,282
292 4,478,283
297 4,478,284
311 4,478,285
324 4,478,286
341 4,478,287
372 4,478,288

CLASS 172

136 4,478,289

CLASS 173

11 4,478,290
147 4,478,291
149 4,478,292
162 R 4,478,293

CLASS 174

15 WF 4,479,029
48 4,479,030
73 R 4,479,031

CLASS 175

4.56 4,478,294
56 4,478,295
92 4,478,296
329 4,478,297
4,478,298
369 4,478,299

CLASS 177

59 4,478,300
70 4,478,301
145 4,478,302
210 FP 4,478,303

CLASS 178

19 4,479,032

CLASS 179

2.51 4,479,033
18 ES 4,479,034
115.5 VC 4,479,035
170.2 4,479,036

CLASS 180

165 4,478,304
215 4,478,305
229 4,478,306
273 4,478,307
326 4,478,308

CLASS 181

167 4,478,309
241 4,478,310

CLASS 182

3 4,478,311
142 4,478,312

CLASS 185

39 4,478,313

CLASS 187

9 R 4,478,314
29 R 4,478,315

CLASS 188

71.9 4,478,316
4,478,317
72.4 4,478,318
170 4,478,319

CLASS 191

36 4,479,037

CLASS 192

0.055 4,478,322
3.3 4,478,323
48.91 4,478,320
53 E 4,478,321
70.17 4,478,324
98 4,478,325
106.2 4,478,326

CLASS 193

40 4,478,327

CLASS 198

479 4,478,328
574 4,478,329

CLASS 200

6 A 4,479,038
67 D 4,479,039
77 4,479,040
81 R 4,479,041
144 B 4,478,347
4,479,042

CLASS 202

158 4,478,685

CLASS 203

49 4,478,686

CLASS 204

2 4,478,687
11 4,478,688
14.1 4,478,689
15 4,478,690
43 R 4,478,691
4,478,692
64 R 4,478,693
77 4,478,694
98 4,478,695
105 M 4,478,697
105 R 4,478,696
106 4,478,698
158 R 4,478,699
192 R 4,478,700
298 4,478,701
4,478,702
4,478,703
412 4,478,704

CLASS 206

38 4,478,330
334 4,478,331
361 4,478,332
380 4,478,333
427 4,478,334
444 4,478,335

CLASS 208

59 4,478,705
138 4,478,706
157 4,478,707
161 4,478,708
257 4,478,709

CLASS 209

17 4,478,710
39 4,478,711
588 4,478,336

CLASS 210

96.1 4,478,712
101 4,478,713
136 4,478,714
198.2 4,478,715
289 4,478,716
500.2 4,478,717
512.3 4,478,718
641 4,478,719
659 4,478,720
4,478,721
672 4,478,722
674 4,478,723
679 4,478,724
703 4,478,725
793 4,478,726

CLASS 211

49 D 4,478,337
126 4,478,339
490 4,478,338

CLASS 212

253 4,478,340

CLASS 215

12 R 4,478,341
32 4,478,342
252 4,478,343

CLASS 219

8.5 4,479,043
69 W 4,479,044
4,479,045
130.32 4,479,046
225 4,479,047
388 4,479,048

CLASS 220

83 4,478,344
85 P 4,478,345
90.2 4,478,346
318 4,478,348
410 4,478,349
436 4,478,350
462 4,478,351

CLASS 221

13 4,478,352
14 4,478,353
34 4,478,354

CLASS 222

54 4,478,355
94 4,478,356
135 4,478,357
213 4,478,358

CLASS 223

002 4,478,359

CLASS 225

163 4,478,360

CLASS 227

7 4,478,361
19 4,478,362

CLASS 228

131 4,478,363
201 4,478,364

CLASS 235

379 4,479,049
474 4,479,050

CLASS 236

38 4,478,365
44 A 4,478,366

CLASS 239

381 4,478,367
430 4,478,368
664 4,478,369
707 4,478,370

CLASS 241

18 4,478,371
35 4,478,372
208 4,478,373
261.2 4,478,374

CLASS 242

47.01 4,478,375
191 4,478,376

CLASS 244

12.5 4,478,377
4,478,378
17.11 4,478,379
199 4,478,380

CLASS 248

71 4,478,381
185 4,478,382
429 4,478,383
467 4,478,384

CLASS 249

20 4,478,385
83 4,478,386

CLASS 250

202 4,479,051
214 R 4,479,052
221 4,479,053
328 4,479,054
338 4,479,055
342 4,479,056
343 4,479,057
4,479,058
385 4,479,059
398 4,479,060
487.1 4,479,061
578 4,479,062

CLASS 251

121 4,478,387
309 4,478,388

CLASS 252

8.5 C 4,478,727
8.57 4,478,728
33.2 4,478,729
34.7 4,478,730
36 4,478,731
49.6 4,478,732
99 4,478,733
117 4,478,734
135 4,478,735
180 4,478,736
186.25 4,478,737
188.31 4,478,738
299.1 4,478,739
299.62 4,478,740
299.63 4,478,741
313 S 4,478,742
522 R 4,478,743

CLASS 254

108 4,478,389
270 4,478,390

CLASS 256

1 4,478,391

CLASS 260

112.5 R 4,478,744
4,478,745
112.7 4,478,746
245.2 R 4,478,748
245.4 4,478,749
245.7 4,478,750
396 N 4,478,751
4,478,753
396 R 4,478,752
410.5 4,478,754
429.5 4,478,755
429.7 4,478,756
453 PC 4,478,757
465 D 4,478,758
465.5 A 4,478,759
465.7 4,478,760
970 4,478,761
983 4,478,762
986 4,478,763

CLASS 261

50 A 4,478,764
76 4,478,765
124 4,478,766
130 4,478,767

CLASS 264

1.4 4,478,768
1.6 4,478,769
2.1 4,478,770
22 4,478,771
4,478,772
31 4,478,773
36 4,478,774
40.3 4,478,775
65 4,478,785
83 4,478,776
102 4,478,777
146 4,478,778
319 4,478,779
328.2 4,478,780
341 4,478,781
345 4,478,782

CLASS 266

44 4,478,392
49 4,478,393
162 4,478,394
196 4,478,395

CLASS 267

8 R 4,478,396

CLASS 269

170 4,478,397

CLASS 270

53 4,478,398
55 4,478,399
57 Re.31,710

CLASS 271

3.1 4,478,400
22 4,478,401
100 4,478,402
189 4,478,403
212 4,478,404
227 4,478,405
293 4,478,406

CLASS 272

18 4,478,407
76 4,478,408
85 4,478,409
4,478,410
118 4,478,411
130 4,478,412
134 4,478,413
4,478,414

CLASS 273

1.5 R 4,478,415
73 C 4,478,416
150 4,478,417
153 S 4,478,418
187 R 4,478,422
259 4,478,419
411 4,478,420
420 4,478,421

CLASS 277

59 4,478,423
80 4,478,424

CLASS 280

433 4,478,425
625 4,478,426
642 4,478,427
651 4,478,428
655 4,478,429
690 4,478,430
710 4,478,431
804 4,478,432
807 4,478,433

CLASS 285

15 4,478,434
39 4,478,435
137 R 4,478,436
189 4,478,437
276 4,478,438
340 4,478,439
392 4,478,440

CLASS 290

30 R 4,479,063
37 R 4,479,064

CLASS 292

216 4,478,441
248 4,478,442
307 R 4,478,443
333 4,478,444
336.3 4,478,445
341.18 4,478,446

CLASS 293

102 4,478,447

CLASS 294

1 BA 4,478,448
10 4,478,449
31.2 4,478,450
106 4,478,451
141 4,478,452

CLASS 297

219 4,478,453
316 4,478,454
362 4,478,455
410 4,478,456

CLASS 299

18 4,478,457

CLASS 301

9 SC 4,478,458

CLASS 303

7 4,478,459
68 4,478,460
92 4,478,461

CLASS 307

247 R 4,479,065
350 4,479,066
475 4,479,067

CLASS 308

6 C 4,478,462

CLASS 310

194 4,479,068
334 4,479,069
338 4,479,070

CLASS 312

9 4,478,464
183 4,478,465
215 4,478,466
250 4,478,467

CLASS 313

25 4,479,071
113 4,479,072
451 4,479,073
628 4,479,074

CLASS 315

111.21 4,479,075
241 P 4,479,076
291 4,478,468

CLASS 318

245 4,479,077
254 4,479,078
345 G 4,479,079
373 4,479,080
696 4,479,081
799 4,479,082

CLASS 320

6 4,479,083

CLASS 323

210 4,479,084
280 4,479,085
315 4,479,086

CLASS 324

58 B 4,479,087
73 R 4,479,088
158 F 4,479,089
454 4,479,090

CLASS 329

122 4,479,091
145 4,479,092

CLASS 330

258 4,479,093
261 4,479,094
4,479,095

CLASS 331

3 4,479,096
111 4,479,097
154 4,479,098

CLASS 332

10 4,479,099

CLASS 333

33 4,479,100

CLASS 335

37 4,479,101
132 4,479,102
229 4,479,103

CLASS 336

219 4,479,104

CLASS 337

4 4,479,105

CLASS 338

160 4,479,106
176 4,479,107

CLASS 339

17 LC 4,478,469
74 R 4,478,470
4,478,471
75 M 4,478,472
89 M 4,478,473
4,478,474
97 R 4,478,475
147 R 4,478,476
198 G 4,478,477
263 R 4,478,478
273 R 4,478,479

CLASS 340

52 R 4,479,108
58 4,479,109
63 4,479,110
365 P 4,479,111
365 VL 4,479,112
501 4,479,113
566 4,479,114
611 4,479,115
620 4,479,116
644 4,479,117
663 4,479,118
731 4,479,119
781 4,479,120
785 4,479,121
825.06 4,479,122
4,479,123
825.44 4,479,124
4,479,125
825.86 4,479,126

CLASS 343

742 4,479,127
756 4,479,128
781 P 4,479,129
802 4,479,130
872 4,479,131

CLASS 346

76 PH 4,479,132
108 4,479,133

140 R	4,479,134
	4,479,135
	4,479,136
141	4,479,137
207	4,479,138

CLASS 250

3.71	4,478,480
3.83	4,478,481
6.6	4,478,482
96.14	4,478,483
96.20	4,478,484
	4,478,485
	4,478,486
96.21	4,478,487
96.23	4,478,488
96.30	4,478,489
162.11	4,478,490
255	4,478,491
257	4,478,492
336	4,478,493
381	4,478,494
392	4,478,495
427	4,478,496
476	4,478,497
546	4,478,498

CLASS 351

211	4,478,499

CLASS 354

125	4,478,501
416	4,478,502
443	4,478,500
480	4,478,503

CLASS 355

1	4,478,504
3 DD	4,478,505
	4,478,512
3 R	4,478,507
3 SH	4,478,506
14 C	4,478,509
14 R	4,478,508
15	4,478,510
28	4,478,511

CLASS 356

323	4,478,513

CLASS 357

24	4,479,139
81	4,479,140

CLASS 358

12	4,479,141
13	4,479,142
44	4,479,143
60	4,479,144
106	4,479,145
147	4,479,146
290	4,479,147
	4,479,148
294	4,479,149
310	4,479,150

CLASS 360

46	4,479,151
	4,479,152
53	4,479,153
69	4,479,154
96.5	4,479,155
104	4,479,156
	4,479,157
130.1	4,479,158
137	4,479,159

CLASS 361

76	4,479,160
154	4,479,161
210	4,479,162
218	4,479,163
235	4,479,164
335	4,479,165
433	4,479,166
	4,479,167
	4,479,168

CLASS 362

5	4,479,169
95	4,479,170
102	4,479,171
135	4,479,172
294	4,479,173

CLASS 363

21	4,479,174
41	4,479,175

CLASS 364

148	4,479,176
159	4,479,177
200	4,479,178
	4,479,179
	4,479,180
411	4,479,181
413	4,479,182
421	4,479,183
424	4,479,184
426	4,479,185
431.05	4,479,186
478	4,479,187
484	4,479,188
500	4,479,189
556	4,479,190
707	4,479,191
719	4,479,192
900	4,479,193
	4,479,194
	4,479,195
	4,479,196
	4,479,197
	4,479,198

CLASS 365

119	4,479,199
175	4,479,200
183	4,479,201
190	4,479,202
218	4,479,203

CLASS 366

2	4,478,514
67	4,478,515
87	4,478,516
101	4,478,517
156	4,478,518
157	4,478,519
345	4,478,520

CLASS 367

47	4,479,204
63	4,479,205
104	4,479,206
107	4,479,207

CLASS 368

8	4,478,521
37	4,478,522
63	4,478,523
204	4,478,524
273	4,478,525

CLASS 369

43	4,479,208
77.2	4,479,209
194	4,479,210

CLASS 370

62	4,479,211
	4,479,212
118	4,479,213

CLASS 371

11	4,479,214
33	4,479,215
61	4,479,216
67	4,479,217

CLASS 372

2	4,479,218
	4,479,219
25	4,479,220
31	4,479,221
45	4,479,222
53	4,479,223
92	4,479,224
97	4,479,225

CLASS 374

172	4,478,527

CLASS 375

1	4,479,226
	4,479,227
7	4,479,228
89	4,479,229
108	4,479,230

CLASS 376

211	4,478,783
298	4,478,784
444	4,478,786

CLASS 378

99	4,479,231
187	4,479,232

CLASS 381

15	4,479,233
	4,479,234
17	4,479,235
43	4,479,236
57	4,479,237
61	4,479,238
72	4,479,239
80	4,479,240

CLASS 382

15	4,479,241
17	4,479,242

CLASS 383

24	4,479,243
63	4,479,244

CLASS 384

482	4,478,463

CLASS 400

124	4,478,528

CLASS 401

53	4,478,529
134	4,478,530

CLASS 403

77	4,478,531
157	4,478,532

CLASS 405

24	4,478,533
96	4,478,534
132	4,478,535
213	4,478,536
217	4,478,537

CLASS 408

6	4,478,538
117	4,478,539

CLASS 409

211	4,478,540
232	4,478,541

CLASS 411

26	4,478,542
34	4,478,543
	4,478,544
57	4,478,545
385	4,478,546

CLASS 414

24.5	4,478,547
502	4,478,548
537	4,478,549

CLASS 415

53 T	4,478,550
142	4,478,551
174	4,478,552

CLASS 416

97 R	4,478,553
221	4,478,554

CLASS 417

7	4,478,555
222	Re.31,711
256	4,478,556
271	4,478,557
296	4,478,558
368	4,478,559
393	4,478,560
400	4,478,561

CLASS 418

88	4,478,562

CLASS 419

8	4,478,787
48	4,478,788
49	4,478,789
54	4,478,790

CLASS 420

590	4,478,791

CLASS 422

56	4,478,792
216	4,478,793

CLASS 423

89	4,478,794
127	4,478,795
155	4,478,796
213.5	4,478,797
224	4,478,798
	4,478,799
230	4,478,800
235	4,478,801
236	4,478,802
244	4,478,803
259	4,478,804
311	4,478,805
328	4,478,806
514	4,478,807
522	4,478,808
	4,478,809
555	4,478,810
574 R	4,478,811
618	4,478,812
644	4,478,813
650	4,478,814

CLASS 424

1.1	4,478,815
4	4,478,816
7.1	4,478,817
14	4,478,818
37	4,478,819
45	4,478,820
47	4,478,821
78	4,478,822
88	4,478,823
101	4,478,824
	4,478,825
177	4,478,826
	4,478,827
	4,478,828
	4,478,829
178	4,478,830
181	4,478,831
210	4,478,832
246	4,478,833
	4,478,834
	4,478,835
248.54	4,478,836
250	4,478,837
	4,478,838
251	4,478,839
260	4,478,840
263	4,478,841
	4,478,842
269	4,478,843
273 R	4,478,844
	4,478,845
	4,478,846
274	4,478,847
285	4,478,848
	4,478,849
304	4,478,850
322	4,478,852
330	4,478,851
358	4,478,853

CLASS 425

71	4,478,563
72 R	4,478,564
141	4,478,565
149	4,478,566
150	4,478,567
320	4,478,568
324.1	4,478,569

CLASS 426

12	4,478,854
41	4,478,855
46	4,478,856
72	4,478,857
126	4,478,858
266	4,478,859
267	4,478,860
295	4,478,861
450	4,478,862
482	4,478,863
534	4,478,864
535	4,478,865
349	4,478,866
570	4,478,867
641	4,478,868

CLASS 427

10	4,478,869
14.1	4,478,870
34	4,478,871
38	4,478,872
40	4,478,873
	4,478,874
41	4,478,875
54.1	4,478,876
62	4,478,877
79	4,478,878
85	4,478,879
86	4,478,880
90	4,478,881
97	4,478,882
	4,478,883
	4,478,884
144	4,478,885
210	4,478,886
211	4,478,887
220	4,478,888
230	4,478,889
252	4,478,890
317	4,478,891
320	4,478,892
387	4,478,893
388.2	4,478,894
407.3	4,478,895
421	4,478,896

CLASS 428

31	4,478,897
36	4,478,898
72	4,478,899
92	4,478,900
120	4,478,901
174	4,478,902
216	4,478,903
288	4,478,904
324	4,478,905
	4,478,906
327	4,478,907
	4,478,908
331	4,478,909
	4,478,910
332	4,478,911
349	4,478,912
383	4,478,913
407	Re.31,712
	4,478,914
607	4,478,915

CLASS 429

9	4,478,916
33	4,478,917
38	4,478,918
179	4,478,919
191	4,478,920
194	4,478,921

CLASS 430

9	4,478,639
58	4,478,922
110	4,478,923
126	4,478,924
137	4,478,925
178	4,478,926
203	4,478,927
217	4,478,928
	4,478,929
271	4,478,930
309	4,478,931
314	4,478,932
496	4,478,933

CLASS 431

344	4,478,570
359	4,478,571

CLASS 432

13	4,478,572
124	4,478,573
180	4,478,574
217	4,478,575

CLASS 433

3	4,478,576
14	4,478,577
165	4,478,578
222	4,478,579
223	4,478,580

CLASS 434

22	4,478,581
170	4,478,582
259	4,478,583
353	4,478,584

CLASS 435

7	4,478,934
72	4,478,747
75	4,478,935
78	4,478,936
172.3	4,478,937
181	4,478,938
200	4,478,939
209	4,478,940

CLASS 436

56	4,478,941
66	4,478,942
80	4,478,943
95	4,478,944
500	4,478,945
518	4,478,946

CLASS 440

112	4,478,585

CLASS 441

4	4,478,586
41	4,478,587

CLASS 445

22	4,478,588
37	4,478,589
50	4,478,590

CLASS 446

177	4,477,998
470	4,477,999

CLASS 455

18	4,479,245
50	4,479,246
179	4,479,247
183	4,479,248
208	4,479,249
213	4,479,250
219	4,479,251
223	4,479,252
226	4,479,253
239	4,479,254
246	4,479,255
265	4,479,256
266	4,479,257
295	4,479,258
318	4,479,259
333	4,479,260
343	4,479,261
352	4,479,262
602	4,479,263
605	4,479,264
	4,479,265
608	4,479,266

CLASS 464

14	4,478,591
173	4,478,592
182	4,478,593

CLASS 474

50	4,478,594
109	4,478,595

CLASS 501

15	4,478,947

CLASS 502

25	4,478,948
77	4,478,949
85	4,478,950
108	4,478,951
110	4,478,952
155	4,478,953

CLASS 518

700	4,478,954
713	4,478,955

CLASS 521

32	4,478,956
112	4,478,957
121	4,478,958
124	4,478,959
160	4,478,960

CLASS 523

105	4,478,961
144	4,478,962
205	4,478,963
216	4,478,964
218	4,478,965

CLASS 524

13	4,478,966
86	4,478,967
88	4,478,968
106	4,478,969
125	4,478,970
376	4,478,971
388	4,478,972
496	4,478,973
533	4,478,974
871	4,478,975

CLASS 525

54.1	4,478,976
61	4,478,977
66	4,478,978
68	4,478,979
92	4,478,981
187	4,478,980
316	4,478,982
332.2	4,478,983
333.6	4,478,984
530	4,478,985

CLASS 526

83	4,478,986
97	4,478,987
128	4,478,988
142	4,478,989
279	4,478,990
287	4,478,991
288	4,478,992

CLASS 527

600	4,478,993

CLASS 528

137	B1 4,206,095
304	4,478,994

CLASS 536

46	4,478,995

CLASS 544

49	4,478,996
71	4,478,997
195	4,478,998
241	4,478,999

CLASS 546

23	4,479,000
291	4,479,001
335	4,479,002
341	4,479,003

CLASS 548

101	4,479,004
230	4,479,005
312	4,479,006

CLASS 549

401	4,479,007

CLASS 564

433	4,479,008
447	4,479,009
477	4,479,010

CLASS 568

361	4,479,011
454	4,479,012
479	4,479,013
	4,479,014
584	4,479,015
606	4,479,016
613	4,479,017
697	4,479,018
709	4,479,019
850	4,479,020
868	4,479,021

CLASS 570

202	4,479,022

CLASS 585

312	4,479,023
437	4,479,024
441	4,479,025

CLASS 604

890	4,478,596

CLASSIFICATION OF DESIGNS

D2—	24	275,999			276,015		158	276,031	D15—	14	276,047		210	276,063			276,078
		276,000		53	276,016	D12—	51	276,032		86	276,048	D23—	28	276,064			276,082
		276,001		57	276,017		110	276,033		90	276,049			276,065	D26—	42	276,079
		276,002		74	276,018			276,034	D16—	1	276,050		95	276,066		48	276,080
	308	276,003			276,019			276,035		31	276,051		121	276,067		104	276,083
D3—	75	276,004		79	276,020		176	276,036		33	276,052			276,068	D27—	30	276,085
D4—	104	276,005		300	276,021		177	276,037	D18—	7	276,053			276,069	D28—	18	276,084
D6—	301	276,012		360	276,022			276,038	D19—	59	276,054		141	276,070		35	276,086
	368	276,007	D9—	344	276,023		192	276,039	D21—	25	276,055	D24—	31	276,071		64	276,088
	487	276,010		415	276,024			276,040		59	276,056		51	276,072		79	276,087
	502	276,006		425	276,025		343	276,041		64	276,057			276,073	D34—	21	276,089
	510	276,011			276,026	D13—	24	276,042		78	276,058	D25—	67	276,074		43	276,090
	513	276,008		452	276,027	D14—	13	276,043		134	276,059		89	276,075	D99—	8	276,091
	570	276,009	D10—	75	276,028		30	276,044			276,060			276,076		34	276,092
D7—	36	276,013		106	276,029			276,045		141	276,061			276,081		35	276,093
	40	276,014	D11—	13	276,030		60	276,046		193	276,062		91	276,077			

CLASSIFICATION OF PLANTS

P.—	39	5,296	44	5,298	48	5,300	54	5,302			
	43	5,297		5,299	49	5,301	70	5,303		5,304	5,305

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PATENTS

01 :	4,478,152		4,479,241		4,478,587		4,478,669		4,479,251
	4,478,774		4,377,886		4,478,615		4,478,671		4,179,254
04 :	4,477,990	08 :	4,477,930		4,478,661		4,478,721	20 :	4,478,026
	4,478,003		4,477,941		4,478,715		4,478,729		4,478,822
	4,478,664		4,478,225		4,478,778		4,478,742		4,479,247
	4,479,070		4,478,283		4,479,034		4,478,769	21 :	4,478,048
	4,479,108		4,478,336		4,479,111		4,478,784		4,478,059
	4,479,158		4,478,399		4,479,124		4,478,793		4,478,163
	4,479,227		4,478,439		4,479,179		4,478,825		4,478,465
05 :	4,478,016		4,479,037		4,479,238		4,478,954	22 :	4,477,943
	4,478,289		4,479,197		4,479,265		4,478,962		4,478,314
	4,478,361	09 :	4,477,973	13 :	4,477,957		4,478,988		4,478,334
06 :	4,477,928		4,478,011		4,478,081		4,478,998		4,478,389
	4,477,962		4,478,013		4,478,140		4,479,025		4,478,467
	4,477,996		4,478,038		4,478,144		4,479,040		4,478,536
	4,477,997		4,478,039		4,478,332		4,479,047		4,478,549
	4,478,025		4,478,054		4,478,333		4,479,057		4,478,813
	4,478,043		4,478,064		4,478,354		4,479,101	24 :	4,477,974
	4,478,045		4,478,303		4,478,359		4,479,105		4,477,993
	4,478,088		4,478,406		4,478,645		4,479,162		4,478,121
	4,478,090		4,478,443	16 :	4,478,747		4,479,189		4,478,148
	4,478,094		4,478,567		4,479,064		4,479,195		4,478,150
	4,478,095		4,478,630		4,479,169		4,479,211		4,478,204
	4,478,111		4,478,651	17 :	4,477,939		4,479,245		4,478,246
	4,478,113		4,478,748		4,477,950		4,479,250		4,478,452
	4,478,127		4,478,776		4,477,970	18 :	4,477,940		4,478,464
	4,478,128		4,478,814		4,478,008		4,478,006		4,478,555
	4,478,147		4,478,834		4,478,101		4,478,103		4,478,656
	4,478,151		4,478,860		4,478,130		4,478,132		4,478,665
	4,478,159		4,478,915		4,478,139		4,478,324		4,478,683
	4,478,224		4,478,986		4,478,155		4,478,366		4,478,779
	4,478,228		4,478,991		4,478,157		4,478,369		4,478,816
	4,478,233		4,479,008		4,478,205		4,478,415		4,479,142
	4,478,263		4,479,136		4,478,237		4,478,425		4,479,148
	4,478,279	10 :	4,478,533		4,478,269		4,478,437		4,479,180
	4,478,295		4,478,682		4,478,290		4,478,566		4,479,199
	4,478,305		4,478,685		4,478,325		4,478,597		4,479,217
	4,478,335		4,478,755		4,478,342		4,478,629	25 :	Re.31,712
	4,478,344		4,478,840		4,478,343		4,478,666		4,477,953
	4,478,345		4,478,968		4,478,364		4,478,701		4,477,963
	4,478,346	11 :	4,478,534		4,478,365		4,478,820		4,477,972
	4,478,349	12 :	4,477,994		4,478,400		4,478,892		4,477,975
	4,478,409		4,478,001		4,478,434		4,478,935		4,477,977
	4,478,417		4,478,033		4,478,468		4,479,107		4,477,991
	4,478,427		4,478,052		4,478,501		4,479,235		4,478,037
	4,478,446		4,478,089		4,478,530		4,479,248		4,478,167
	4,478,469		4,478,135		4,478,535	19 :	4,477,982		4,478,429
	4,478,480		4,478,168		4,478,546		4,478,014		4,478,476
	4,478,483		4,478,177		4,478,605		4,478,041		4,478,494
	4,478,486		4,478,203		4,478,614		4,478,307		4,478,641
	4,478,490		4,478,312		4,478,617		4,478,358		4,478,696
	4,478,495		4,478,551		4,478,634		4,478,761		4,478,762
	4,478,519		4,478,584		4,478,667		4,478,857		4,478,805

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